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Community size, housing characteristics and housing satisfaction

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by

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CHAPTER I. INTRODUCTION

"Housing touches every individual at all periods of his life span" (Beyer, 1965, p. 489). Indeed housing is a shelter that in most societies provides in one form or another the physical locus for the functions of the daily routine of rest, work, and nourishment.

Of prime concern in this thesis is social research with respect to various aspects of residential housing. As noted by Hanan Selvin (1951, p. 173): "The early period of social research on housing was largely confined to social bookkeeping." However, in the twenty-five or so years since then, social research in housing has made a conscientious effort to accurately measure housing conditions and needs and thus has gained a place in the realm of noteworthy scientific investigation.

With the promotion of scholarly activity in the field and the encouragement of better training for research in housing, attempts have been made to: 1) review existing data; 2) clarify conceptual definitions and re-examine assumptions; 3) formalize patterns of research procedures; 4) test for interrelations among variables and continue the search for new explanatory variables; and 5) encourage professional collaboration between the technical and social sciences.

Hopefully, the outcome of such research will have positive effects upon policy and practice in all areas of housing. The importance of the development of widely accepted residential paragons is indicated by Wallace Smith (1970): "The nature of the dwelling and of its surroundings creates a scheme in which behavior by the individual has effects external

to him" (p. 30). "The modal concept of what 'good' housing should be tends to become the prescription for what all housing should be" (p. 29).

Purpose

A rural-urban continuum can be represented by population variations as seen in varying sizes of communities. It may be hypothesized that varying sizes of communities would influence housing with respect to tenure, value, structural characteristics, housing quality, and neighborhood satisfaction. Demographic and socioeconomic variables could also be potential determinants of these same housing features and therefore consideration of these characteristics is warranted in a hypothesized causal model. Further, housing characteristics, housing quality, and neighborhood satisfaction appear to be appropriate elements of intervening relationships between community size and housing satisfaction. Improved measurement of housing satisfaction is of major importance in the study of housing as a social science.

The task of developing all areas of housing research is monumental and, of course, is an impossible burden for one person, therefore, credible housing research is dependent upon the contributions of many individuals each adding a small but hopefully significant increment to knowledge. It is for this general purpose that this thesis is presented.

The concepts underlying this study include: size of community, housing characteristics, housing quality, neighborhood satisfaction, and housing satisfaction. These concepts are thought to be related as shown

in Figure 1. The specific purpose of this thesis is to analyze the influence of size of community on housing conditions and on the satisfaction that such conditions produce.

Theoretical Background and Review of Literature

Community size and the rural-urban continuum

> "The only thing that seems to be agreed upon generally by writers on rural or urban topics is that in some vague way the terms in question are related to city and country, to community variations in size and density of population" (Dewey, 1960, p. 60).

In the early 1950's the term "rural-urban continuum" came into vogue and has since been perpetuated in a vast number of sociological and anthropological writings. It would appear that the concept is an attempt at amending the old and somewhat inaccurate notion of a rural-urban dichotomy (Duncan, 1957, p. 35). One of the first major proponents of the rural-urban continuum concept was Louis Wirth (1938) and since that time a number of social scientists have endorsed the concept as being one of the more acceptable alternatives for purposes of description of aspects of North American society (Duncan, 1957; Miner, 1952; Schnore, 1966; Sorokin and Zimmernan, 1929; Van Es & Brown, 1974; Wirth, 1938). The concept of the rural-urban continuum is an unbroken line representing gradually varying degrees of demographic and socioeconomic characteristics between two poles--rural on one end and urban on the other. No social researcher of course would suggest this to mean that there are not branches in the line, however, evidence indicates that most offshoots can be considered secondary to the main line continuum and are the exception rather than the rule due to the weakness of their influence.

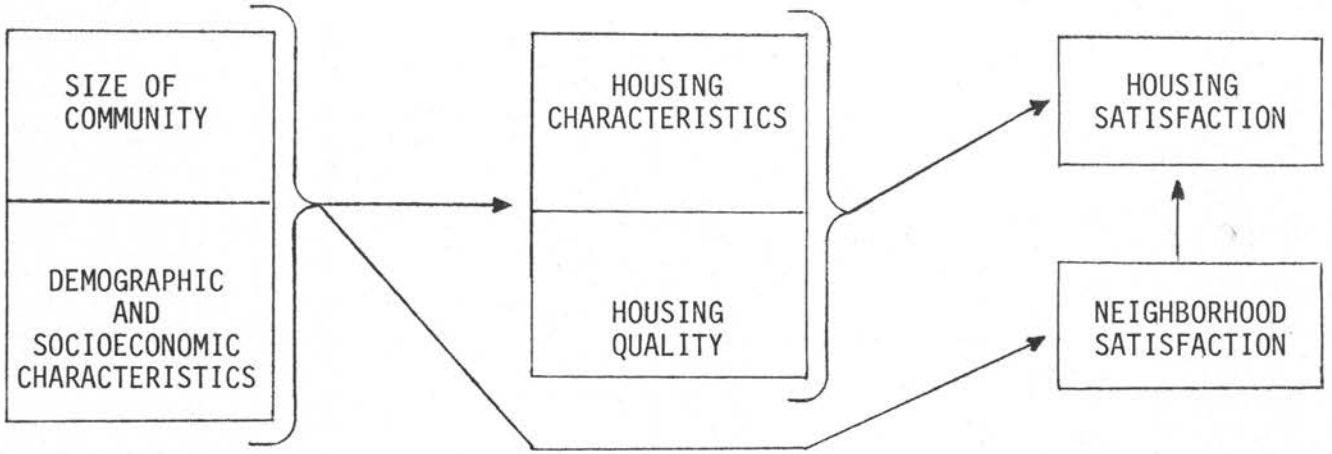


Figure 1. Diagram of hypothesized causal model.

There is a considerable amount of disagreement about the appropriateness and usefulness of the concept of the rural-urban continuum (Stewart, 1958). The main objections seem to be centered around the linear connotation of continuum and the static quality suggested by scaled intervals. As an alternative they have proposed multidimensional models, however, as yet their schemes are not easily interpreted nor operationally sound. The author has chosen the option of the continuum as it serves to most clearly illustrate the independent variable at hand--community size.

An elaboration of the concept of the rural-urban continuum would clarify the dimensions that it encompasses.

Schnore (1966) points out that

> "In the contemporary world, sharp and absolute divisions between community forms do not exist, and it is futile to pretend that they can be found. Nevertheless, the basic concepts of "rural" and "urban" remain useful, because they point to differences between communities that are too important to be ignored" (p. 135).

Rural suggests to many that sector of society which is directly associated with agriculture or other such primary activities (Schnore, 1966) and is characterized by low population density and small homogeneous communities (Dewey, 1960; Duncan, 1957; Stewart, 1958; Van Es & Brown, 1974). Urban, on the other hand, supports a labor force involved in the secondary and tertiary activities of manufacturing and services (Schnore, 1966) and is essentially heterogeneous in nature and exhibits relatively high population density (Dewey, 1960; Duncan, 1957; Stewart, 1958; Wirth, 1938).

A reasonable scale for measuring the rural-urban continuum would seem to be size of community. As a strong supporter of this notion Duncan (1957) reinforces the assumption of this thesis that

> "The community size classification . . . stands for the 'rural-urban continuum' as an independent variable. Several dependent variables are related to the independent variable, and their regressions on community size are examined for evidence of 'continuous graduation' and 'consistent variation'" (p. 37).

Different aspects of housing serve as dependent variables for the thesis study and the results will be an indication of the relationship between various characteristics of housing and size of community. Duncan (1957) suggests further that one should also inquire how other factors such as demographic, socioeconomic, and family characteristics influence the variables and at the same time warns of possible misleading interpretations due to extrapolation of results to cover the entire range of the continuum when only partial breakdowns were studied. In addition, concern was expressed in terms of the rigidity and preciseness implied by the term "scale." It is important that limitations be recognized and accounted for and then quality research may be done.

In current evaluations of rural-urban trends, housing has not often been considered. There was a time (mid-1950's) when housing and home design related projects were a part of almost every Cooperative Extension Service and many Agriculture Experiment Stations. A multitude of studies were produced evaluating the conditions of homes throughout the United States (Beyer & Rose, 1957; Dean, 1953; Freedman & Freedman, 1956; Bureau of Human Nutrition and Home Economics, U.S. Department of Agriculture, 1952; Thorpe & Gross, 1952; Trotter & Liston, 1954). Now it would appear that the task of evaluating housing for the individual has been transferred to a macro-level and is under the guidance of agencies dealing with

urban planning and community development. Perhaps this is one reason why housing seldom appears as a variable in rural-urban continuum studies.

The most common elements appearing as the distinguishing factors in the rural-urban continuum seem to have developed from Wirth's (1938) oft-quoted essay. Dewey (1960) summarizes Wirth:

> "Size and density of population induces concomitant variations in these five qualities:
> 1. Anonymity.
> 2. Division of labor.
> 3. Heterogeneity, induced and maintained by (1) and (2).
> 4. Impersonal and formally prescribed relationships.
> 5. Symbols of status which are independent of personal acquaintance" (Dewey, 1960, p. 65).

Although those characteristics may be diminishing as obvious delineations, they are still identifiable elements in the continuum.

> ". . . many differential characteristics of the rural and urban community would consist not so much in the presence of certain traits in rural, and their absence in urban communities, as much as in a quantitative increase or decrease of these characteristics" (Sorokin & Zimmerman, 1929, p. 14).

This is the only logically acceptable speculation to hold with respect to the relation among variables comprising the rural-urban continuum. In this thesis differences based upon (1) the <u>degree</u> to which housing characteristics are present, (2) the condition or quality of housing, (3) the level of neighborhood satisfaction, and (4) the level of housing satisfaction will be looked into in terms of the key independent variable--community size.

Structural housing characteristics and design features; existence, condition and quality

> "It has often been argued or assumed that the physical nature of family dwellings helps to mold the attitudes of people in a community toward one another, so that by changing the style of residential behavior new social outlooks can be instilled. Thus, in the United States, great importance has been attached to ownership of single-family homes in the belief, often consciously and explicitly put forward, that this type of living arrangement fosters the kind of citizenship which corresponds to traditional American values" (Smith, 1970, p. 75).

This passage illustrates two concepts that warrant further explanation as they are so very much a part of North American culture. The first is the concept of norms. Morris and Winter (1975, p. 79) note that, "There are two criteria used by families to judge their housing conditions, family norms and cultural norms." "Cultural norms are rules for proper behavior or proper life conditions" (Morris & Winter, 1974, p. 14) whereas the family norms are norms that individual families have set for themselves. Family norms are usually influenced to varying degrees by cultural norms, and by the ability of the family as a unit to deal with constraints. Three kinds of constraints may be present in terms of housing adjustment and these may also be found in the formation and stability of family norms with respect to housing.

> ". . . (1) intrafamilial strengths and weaknesses when confronted with decisions, particularly the family's capacity to achieve consensus; (2) economic, social and political factors such as racial discrimination and the state of the housing market; and (3) attractive features of the dwelling" (Morris & Winter, 1975, p. 83).

In addition, the amount of importance that the family places upon its own housing norms and the cultural norms respectively aids in determining the family's housing behavior and their satisfaction with achieved housing

(Bross, 1975). It is evident from the literature that both cultural and family norms govern attitudes and behavior with respect to structural housing characteristics. Similar observations have been made in terms of housing quality and this aspect is considered in the next section of the literature review.

The second concept is that of tenure which is a function of North American housing norms. Tenure refers to kind of right or title by which real estate is held. Many authors have found that home ownership is perhaps the most important housing characterstic due to its strength as a cultural norm (Beyer, 1965; Hinshaw & Allott, 1972; Michelson, 1967; Morris & Winter, 1974, 1975; Smith, 1970). This phenomena of our culture has been a major element for two centuries and it would appear that this pattern is not altering to any great extent. Hinshaw and Allott (1972) note: "Our study indicates that the desire for single-family home ownership is ubiquitous and not in the process of radically changing" (p. 107). This is true for other parts of North America as well. "Single detached homes continued to be the predominant type of housing accommodation in Canada in 1971, although their relative numbers have gradually declined in favor of multiple-type dwellings" (Statistics Canada, 1975, p. 580).

Many services available to the public cater to the notion of single family home ownership particularly financial institutions and government agencies (Smith, 1970, p. 75) and the enculturation of such norms is successfully conducted by parents, older siblings and the formal education system (Morris & Winter, 1974) at an early age.

Morris and Winter (1975) discuss four other norms in addition to tenure norms: housing space, structure type, quality, and neighborhood and location norms. Three of these remaining groups (structure type, quality and neighborhood) have some bearing in this thesis as they are represented in the analysis by dependent and independent variables. Quality and neighborhood norms are explained further in this chapter while Chapter II contains the definitions of the variables and elaborates upon their theoretical and operational implications. At this point, a brief interpretation of housing norms will suffice.

"Space norms prescribe the amount of space a family should have, and are dependent upon family size and composition" (Morris & Winter, 1974, p. 143). Structure type and tenure norms are closely associated with one another. "It seems quite clear that the norms prescribe ownership of a single family dwelling" (Morris & Winter, 1974, p. 164). Quality norms are more nebulous in their conceptualization. ". . . [H]ousing quality implies attention to the question of what objective attributes are thought of as contributing to quality" (Morris & Winter, 1974, p. 180), and ". . . are all a part of the desirability equation" (Morris & Winter, 1974, p. 181). Neighborhood and location norms refer to 1) location as site, 2) location as physical environment, and 3) location as social environment (Morris & Winter, 1974, p. 192).

Another aspect of housing characteristics is that relating to the worth of the dwelling as determined by the occupants' evaluation of their property.

> "Both the community and the individual household are interested in the housing status of that household. By 'housing status' we mean the whole complex of activities, satisfactions, rights, obligations, conveniences, expectations surrounding the use of a particular dwelling unit by a particular household. In turn, both the community and the individual household participate in determining what this housing status will be" (Smith, 1970, p. 23).

Housing status has four components: 1) structural and physical attributes, 2) accessibility and utilities, 3) rights, and 4) neighborhood (Smith, 1970) and it is the individual rating of these items that determines housing status. Market value of a dwelling is the economic counterpart of housing status. ". . . [O]ne of the most direct indexes of desirability of a dwelling unit is its market value" (Morris & Winter, 1974, p. 191). The value of a dwelling to an outsider is seen as reflections of the condition of the property and neighborhood as well as reflections of the general economic conditions of the community. Generally speaking, the market value of housing has been steadily increasing over the past 10 years in most areas of North America (U.S. Department of Housing and Urban Development, 1972, Table 347). Many persons are unaware of the current monetary worth of their property as it is rapidly changing with inflation rates and the increased demand for housing.

Housing quality, as mentioned earlier, is somewhat in limbo with respect to its place in the realm of abstract conceptualization and concrete measurement.

> "The measurement of the desirability or quality of a dwelling unit necessarily is subjective in the sense that the phenomena to be measured are the subjective reactions of people to attributes of a dwelling unit. Thus the definition and measurement of housing quality implies attention to the question of what objective attributes are thought of as contributing to quality" (Morris & Winter, 1974, p. 180).

Market value of a home is highly dependent upon housing quality as noted. In addition, the socioeconomic factor of income is related to housing quality norms (Morris & Winter, 1975). "The quality norm may be approximated by the luxury of the housing available relative to the percentage of income that properly should be devoted to housing" (Morris & Winter, 1974, p. 171).

The first major attempts at measuring quality of housing were conducted by the United States Bureau of the Census in the Censuses of 1940, 1950, and 1960. The concept of "state of repairs" was the first basis for their measurements (U.S. Bureau of the Census, 1967, p. 1) and they looked at physical conditions in terms of two criteria: 1) "not needing major repairs" and 2) "needing major repairs" (U.S. Bureau of the Census, 1943). In an effort to improve their measurement the Census Bureau added the concept of structural condition to their evaluation of housing in the 1950 census. Thus both physical safety features and level of adequacy (U.S. Bureau of the Census, 1967, p. 1) were being considered. In the late 1960's, the Bureau of the Census reviewed their methods of gathering housing data and found that the quality ratings of a house would vary substantially with different enumerators (U.S. Bureau of the Census, 1967, p. 5) and therefore it was decided to suspend the rating of structural conditions until more reliable measurements could be made in terms of those housing features.

A new approach was to be taken in the 1970 census and dwellings were rated by five variables which were highly correlated to structural quality. These variables were: heating conditions, persons-per-room, educa-

tion level of household head, structure type, and house value or rent (U.S. Bureau of the Census, 1969). These along with an evaluation of the plumbing facilities were to be combined in a weighted system to give a measurement of housing quality.

Statistics Canada (1975) has compiled a yearbook that gives information from the Canadian census reports and includes material on housing and construction. Decennial censuses provide an inventory of a variety of household facilities and equipment to measure living standards and to provide data for market research (Statistics Canada, 1975, p. 583). The Canadian census covered items such as plumbing and sanitary facilities, heating equipment and household equipment such as refrigerators, dishwashers, televisions, etc. (a total of 42 items) and is categorized by whether or not the item exists in a particular household. Housing characteristics such as type of dwelling, tenure, and size of dwelling (number of rooms) were given along with the customary demographic figures.

> "Morris et al. (1972) identified three dimensions of quality: (1) structural quality, which refers primarily to durability of the shell; (2) service quality, which is concerned with the kinds of equipment, facilities and conveniences the dwelling provides; and (3) the state of maintenance and caretaking" (Morris & Winter, 1974, p. 184).

Their study considered quality in terms of 26 items scored on the basis of whether or not the particular characteristic was present or absent in the dwelling and then these figures were summed to provide an index of housing quality (Morris, Woods & Jacobson, 1972). As with the census, plumbing facilities appeared to serve well as an indication of overall quality. Structural quality is also important but it is more difficult to obtain

reliable measures due to the subjectivity involved in evaluating defects (Morris et al., 1972, p. 383).

In their evaluation of the quality of the residential environment, Kain and Quigley (1972) found that, "In spite of the multi-dimensional character of residential quality, for many purposes it is useful to have a single quality index" (p. 29). Morris et al. (1972) agreed that a single quality index was a valid and appropriate measure and noted that it is not necessary to register both the exterior and interior of a housing unit to obtain an assessment of quality (Morris et al., 1972, p. 386).

When asking for a respondent's opinion, any statement concerning the desirability of particular housing characteristics needs to be interpreted as a reaction of the individual to deficiencies in a previous home situation, as a reaction to recent changes in the dwelling, or as the reaction of one whose housing needs are saturated (Riemer, 1951). When an "impartial" trained interviewer evaluates the structural quality of a dwelling these same emotions are present but at a very low level of influence. Using the criterion of the presence and absence of housing features further removes the subjectivity of the measurement of quality. At the same time this last method is a more direct measure of quality than those that incorporate demographic or socioeconomic variables as indicators (Harris, 1976).

Residential satisfaction

The question of housing satisfaction has caught the interest of several social scientists and a number of works have been written expounding upon various behavioral aspects associated with this variable

(Bross, 1975; Foote, Abu-Lughod, Foley & Winnick, 1960; Morris, 1976; Morris, Crull & Winter, 1976; Riemer, 1951; Speare, 1974). Residential satisfaction can be measured by a variety of means some of which may include "characteristics and aspirations" of the household, the characteristics of the "location and social bonds" between members of a household and other persons (Speare, 1974) and housing status of that household (Smith, 1970).

Some of the characteristics of a household that are factors influencing residential satisfaction are: age of head, level of education, length of residence in a particular dwelling, crowding, tenure status and income level (Speare, 1974). Age is perhaps the most accurate single predictor of the degree of residential satisfaction. This is understandable when one considers that there is usually a strong correlation between an individual's age and the other five variables mentioned (Speare, 1974). In other words, with increased age, level of income generally increases until retirement, single family home ownership is more likely, duration of residence in a particular dwelling increases, social bonds with others are usually well-established, and crowding within a household decreases as children begin to leave home. All these trends have the effect, as one would expect, of increasing an individual's degree of housing satisfaction.

Speare (1974) incorporated into his survey instrument questions concerning specific housing, neighborhood and location items. He tested the hypothesis that residential satisfaction is an intervening variable between housing, neighborhood, and household characteristics and residential

mobility. His findings clearly support the hypothesis and attempts are being made by other researchers to elaborate and expand the concept of residential satisfaction. In a self-evaluation Speare noted that, "The measure of residential satisfaction could be improved by adding items on housing costs and physical condition of the housing unit" (Speare, 1974, p. 187).

Morris and Winter have done extensive research on housing norms, normative deficits, housing satisfaction, and residential mobility. They have concluded that:

> "The strongest influence on housing satisfaction is neighborhood satisfaction, supporting the generalization that a dwelling is evaluated both on the basis of its specific character and on the character of surrounding housing. The next most important factor was living in a multiple dwelling when a single family dwelling is needed (negative structure deficit). Having a shortage of bedrooms relative to need was third in importance, with satisfaction declining as the shortage of bedrooms increased. Of similar strength was the renter deficit which involves being a renter while desiring ownership. The only other variable related to satisfaction was recent mobility. As hypothesized, recent mobility is positively correlated with satisfaction" (Morris et al., 1976, p. 317).

It is evident from the material presented that housing satisfactions are based upon psychological elements as well as upon physical attributes. Of major consequence are the normative deficits (Morris & Winter, 1974, p. 288). A deficit, as indicated earlier, occurs when the household's housing fails to accommodate its normatively derived needs. "Every family periodically evaluates its housing according to some weighted average of the normative criteria, testing whether the housing meets family needs" (Bross, 1975, p. 4). All deficits are contingent upon the household's awareness of the deficit and the saliency of the situation

before it is considered to be a problem. Internal and/or external pressures will act upon the household unit with the result that the unit will probably try to compensate for the deficit. Morris and Winter (1975) found that there were typically three behavioral responses to such a situation: "(1) residential mobility, (2) residential alteration, or (3) family adaptation" (Morris & Winter, 1975, p. 79).

Deficits are not necessarily negative in the sense of a shortage or absence of some characteristic. There also can be positive deficits when, for example, a family has too many bedrooms relative to that prescribed by the cultural norm. It has been shown that "satisfaction is less responsive to positive deficits" (Morris et al., 1976, p. 318).

"The combination of factors--the norms, the current housing conditions, and the constraints--combine to produce family preferences" (Morris & Winter, 1975, p. 83). Preferences are not absolute, permanent and tangible entities. They are part of a continuing process of home adjustments (Riemer, 1951). It is assumed that the family ranks the alternative combinations of attributes of the dwelling in such a way as to maximize their satisfaction. The resultant set of rankings is referred to as the preference function (Ferguson, 1972, p. 18).

Residential satisfaction encompasses both housing and neighborhood satisfaction concepts. Neighborhood norms in North America stipulate that a home should be part of a well-maintained residential community, have access to modern and progressive educational facilities within easy walking distance, and the population should be homogeneous in terms of socioeconomic class and race. As expected in view of earlier disclosures,

neighborhood satisfaction is related to housing satisfaction (Morris & Winter, 1974).

The research undertaken in this thesis investigates differences in housing characteristics among households in different sized communities and the relative levels of residential satisfaction. Housing characteristics, housing quality, and neighborhood satisfaction are tested for their strength as intervening factors in the relationship between community size and housing satisfaction. Demographic and socioeconomic characteristics--exogenous variables--are controlled in view of their status as potential independent variables in the hypothesized causal model.

CHAPTER II. PROCEDURES

The Sample

The data for this thesis were obtained from an extensive housing survey that was conducted in the Fort Dodge Rural Development area of Iowa (Figures 2 and 3) and was sponsored by the Fort Dodge, Iowa Department of Planning, YOUR, Inc., MIDAS Regional Planning Commission, the Iowa Agriculture and Home Economics Experiment Station (Project 2115) and anonymous donors.

> "The present research bases the assessment of housing needs on four key types of information: (1) current area housing conditions, (2) the socioeconomic characteristics of the area households, (3) the attitudes, desires, aspirations, and satisfactions of those households, and (4) their perceptions of the scarcity of housing" (Morris, Winter, Crull & Dagitz, 1977, p. 1).

A total sample size of 1267 housholds was gathered over a two year period (1975 and 1976) from a six-county area encircling the city of Fort Dodge, Iowa and included incorporated communities ranging from a small town with a population of 270 to a city of approximately 32,000 persons. Four community-size groups were established based upon populations as reported in 1970:

"1. Under 2000: Lake City, Otho, Moorland, Kamrar, Knierim;

2. 2000-4999: Clarion, Rockwell City, Belmond, Pocahontas;

3. 5000-9999: Webster City, Humboldt-Dakota City, Eagle Grove;

4. 10000 plus: Fort Dodge" (Morris et al., 1977, p. 3).

As indicated above, sponsorship for the project was received from various organizations and agencies, however, all surveys were in the form of an interview administered by trained interviewers. Three different forms of

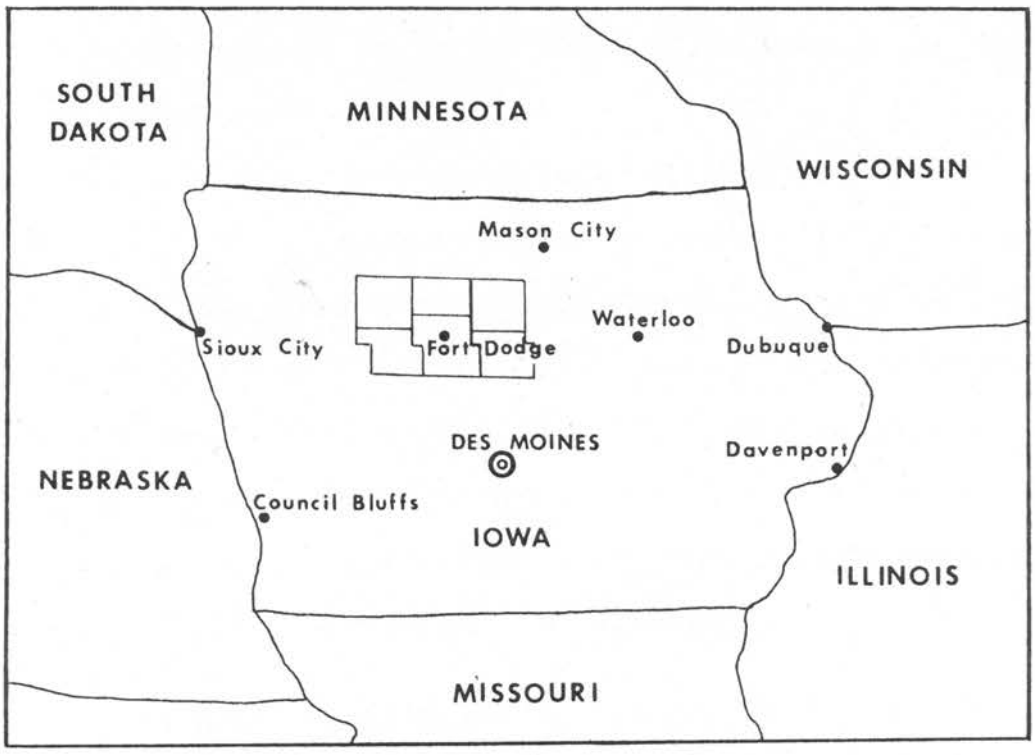


Figure 2. Location of the Fort Dodge Rural Development Area.

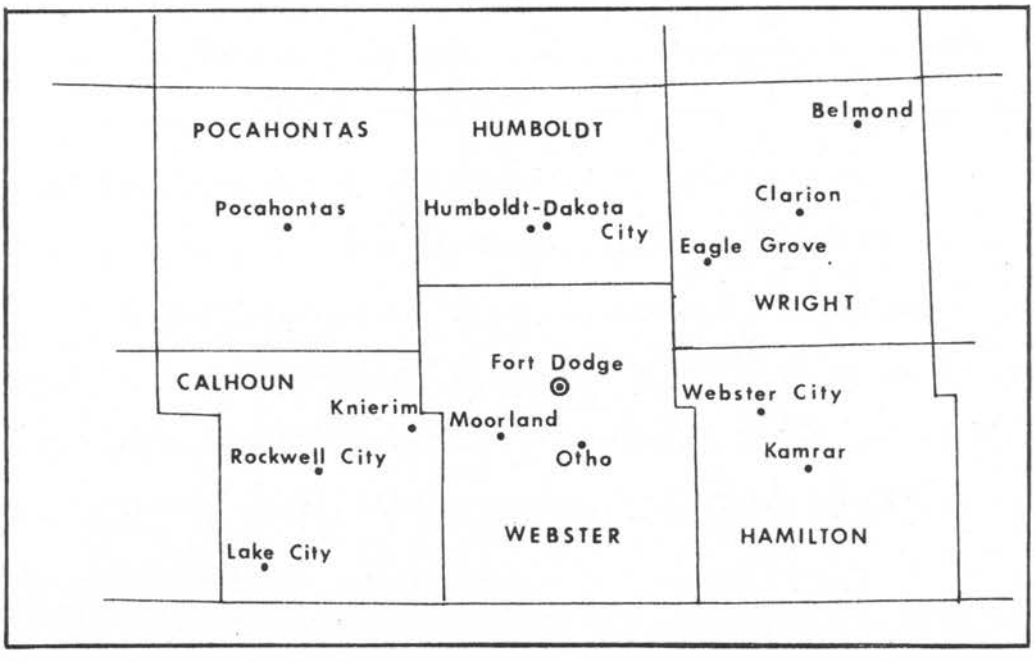


Figure 3. Sample communities in the Fort Dodge Rural Development Area.

the interview were used due to the variations in the goals of the sponsors from community to community.

Data were collected from a stratified probability sample of the population and was not a complete enumeration, however, the responses indicate a relatively close correspondence with data from the 1970 census. Sampling rates and the qualifications and training of the interviewers varied to a certain degree from town to town and therefore the findings are presented in ranges of population categories to minimize possible error. A minimum of 67% completion was established for each community in terms of obtaining the optimum number of interviews.

Scales, Reliability and Multicollinearity

Some of the variables used in the final analyses are the tabulation of responses to a single item in the questionnaire while other variables are combinations of items into scales to give improved measurement. In the following section on definitions of the variables, a complete description of the single item and scaled variables is given.

All scaled variables used in the analysis are tested for reliability so that within multiple-item variables all items are contributing to the purpose of the scaled variable. Conceptually, reliability can be defined as the degree of consistency between two measures of the same thing (Mehrens & Lehmann, 1969). Theoretically, reliability is defined as the ratio of two variances:

$$r_{xx} = \frac{S_t^2}{S_x^2} \quad \underline{or} \quad r_{xx} = 1 - \frac{S_e^2}{S_x^2}$$

where

r = correlation coefficient

xx = repeated measurement of the same trait

S_x^2 = the variance of a group of individuals' observed scores

S_t^2 = the variance of a group of individuals' true scores

S_e^2 = the error variance

If all the variation in observed scores is due to measurement error, the reliability coefficient would be 0 and if there is no measurement error at all then the reliability coefficient would be 1 (Specht, 1975, p. 16). A reliability coefficient demonstrates whether or not the test designer was correct in expecting a specific collection of items to yield interpretable statements about individual differences (Cronbach, 1951, p. 297).

For purposes of this thesis Cronbach's alpha coefficient is used to infer or estimate true score variance as it cannot be directly measured. Alpha is the average of all possible split-half coefficients for a test in which the test is rescored, half the items at a time, to obtain two estimates. A high alpha is to be desired. To exemplify this concept: If the alpha reliability coefficient is .75 then it can be inferred that 75% of the variation of the observed score is the true measure and 25% of the variation is due to measurement error. Note that the criterion set for acceptable scales established for this thesis include: 1) an alpha coefficient of .64 or above, 2) an alpha based on raw score and an alpha based on standardized scores that are nearly equal in magnitude, 3)

numbers within the correlation matrix within the same range, and 4) no increase in alpha when any single item is omitted.

Tables indicating intercorrelation of items and alpha coefficients for most of the scaled variables are present in the following section of this chapter. The exceptions are the widely accepted scales such as socioeconomic class and single family home ownership.

Multicollinearity refers to the situation where independent variables vary so strongly that separation of their effects on the dependent variables is nearly impossible. One of the indications of multicollinearity is a high cross section correlation. In order to conduct meaningful multiple regression analysis, variables falling into this category might either be integrated into a single scale or one of the variables would be selected to best represent the concept of the variables concerned (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975). Zero-order correlations of all variables can be made using Pearson product-moment correlations for pairs of variables. The resulting matrix would serve to indicate which variables are highly correlated by way of correlation coefficients and then these variables can be dealt with accordingly.

Conceptual and Operational Definitions of the Variables

There are four categories of variables to be considered: 1) the independent variable--size of community; 2) the control variables which are a group of exogenous variables including demographic and socioeconomic characteristics; and 3) intervening variables which in this case include housing characteristics, housing quality, and neighborhood satisfaction, and 4) housing satisfaction.

The exogenous variables

Size of community is the independent variable of major consequence in this thesis. As indicated earlier there are four community-size groups based upon population. Group I includes incorporated areas with population of less than 2000. Group II consists of towns between 2000 and 4999 persons. Group II is comprised of communities with population ranges of between 5000 and 9999 and Group IV is an urban community of more than 10000 persons.

The four groups are treated as a set of mutually exclusive dummy variables. These variables will be used in conjunction with the continuous variables to perform a covariance analysis (Kelly, Beggs, McNeil, Eichelberger & Lyon, 1969). The goal will be to obtain estimates of the means of the dependent variables for each size of community corrected for the effects of the control variables. The analysis tests the difference between Group IV and the other groups.

Age of the head of the household is a single item variable coded on a continuous scale and subdivided into three categories for purposes of crosstabulation: under 35, 35 to 64, and over 64. This variable along with marital status of the head of the household and size of the household are indications of the stage in the family life cycle of the household. If the respondent was currently married with the spouse present the head of the household was considered to be the male.

For purposes of this study, marital status of the head of the household was coded as a dummy variable in that only two possible categories

exist: (0) currently not married and (1) currently married. Currently not married included those who never married and those who were separated, divorced, or widowed. About 70.5 percent of the total sample are currently married and 29.5 percent are not.

Size of the household is the total number of persons living in a dwelling including children living at home and other adults. The average household size for the total sample is 2.8.

The literature concerning the social aspects of housing choice has found that socioeconomic status, whether considered in terms of income, occupation, or education, has been related to choice of residential environment (Michelson, 1967).

Socioeconomic class is a multiple item variable which is generally accepted as a reliable scale when it is composed of the items indicated above and this was supported by the Pearson correlation coefficients of these variables. The three variables, total household income, occupation of the head of the household and education of the head of the household, were each categorized into three levels. Tables 1, 2, and 3 present the basic data for the three variables. The variables were then combined into an additive scale. The minimum score is 3 and the maximum is 9 (Table 4). Note that because of the fairly large number of missing cases in total household income a score was estimated for these households based upon the average of their education and occupation scores. The same is true for missing cases in either of the other two variables. The following equation depicts the mechanics of the estimation process:

Table 1. Codes for total household income

(1) Low income (under $7000 per year)
(2) Medium income ($7000 to $14999 per year)
(3) High income ($15000 or more)
(4) Missing data

Table 2. Codes for education of household head

(1) Less than 12 years
(2) High school graduate
(3) More than 12 years
(4) Missing data

Table 3. Codes for occupation of household head

(1) Service worker, unskilled laborer and semiskilled laborer
(2) Skilled laborer and clerical-sales
(3) Semiprofessional, professional and managerial
(4) No occupation and missing data

Table 4. Scores of socioeconomic class

Income level	Education level	Occupation level	Score
Low	Low	Low	3
Med	Low	Low	4
Low	Med	Low	4
Low	Low	Med	4
Med	Med	Low	5
Med	Low	Med	5
Low	Med	Med	5
Med	Med	Med	6
High	Med	Med	7
Med	High	Med	7
Med	Med	High	7
High	High	Med	8
High	Med	High	8
Med	High	High	8
High	High	High	9

if VARA = 4 and VARB and VARC ≠ 4

then SEC = VARB + VARC + (VARB + VARC ÷ 2)

where

VARA = the variable with the missing data

VARB and VARC = the other two variables

4 = code for missing cases

SEC = socioeconomic class

Households with more than one missing variable out of the three were classified as missing cases for the socioeconomic variable.

Length of residence in this community since marriage is the last of the independent variables. This variable may have some bearing as to what the household has become accustomed to in housing. It was measured in number of years since marriage that the respondent had resided in the community. Those who were never married had the length of residence calculated from the age of twenty. Both time limitations are an effort to screen the parental desires from the respondent's desires (Morris et al., 1977). Length of residence in the community is fairly highly correlated with age of the head of the household thus risking multicollinearity problems, however, the researcher chose to include this variable due to its theoretical import. No attempt is made to treat age and length of residence as separately important.

Housing characteristics

The dummy variable, single-family home ownership is the first of the variables under housing characteristics to be discussed. It is a combination of two variables as the label suggests. Structure type is one and it

has four possibilities: 1) one-family detached house, 2) one-family house attached, 3) a building with two or more apartments, and 4) mobile home. Tenure, the second variable, refers to the type of holding rights that persons have to property and dwelling in which they live. There are three possible categories: 1) own, 2) rent, and 3) use free. The created variable called single-family home ownership has only two possibilities: 1) single-family homeowner and 2) not single-family homeowner. In the total sample of this study about 73.1 percent fall into the group of single-family homeowners. The remaining cases include owners (landlords) living in multiple dwellings, tenants living in multiple dwellings, renters of single-family dwellings, and residents of mobile homes.

Total number of rooms in this dwelling includes bedrooms, living room, family room or recreation room, dining room, kitchen, sewing room or workshop, and den or library. It does not include full or half bath, utility areas, laundry room, garage or any unfinished enclosed rooms. The total sample average is 5.6 rooms on a scale with a range from one to eight.

Monthly value of housing services refers to the estimated dollar value of the housing services by a household from its dwelling. This variable is composed of two items, one relating to renters and the other relating to owners. The former is quite straightforward as it is the monthly rent payment for the household. The latter is somewhat more obscure as it involves converting the estimated market value of the respondent's home into equivalent rent dollars. Several authors agree that there seems to be no systematic bias to estimates of house value made by the occupants (Kain

& Quigley, 1972; Kish & Lansing, 1954). Following Morgan (1974), "6% of house value as estimated by owner" was used to equate market value to annual rent. For crosstabulation the sample was divided into four groups in terms of housing services received. These groups ranged as follows: 1) $0.00 to $69.99, 2) $70.00 to $129.99, 3) $130.00 to $375.00, and 4) missing cases.

Number of floors in this building is another housing characteristic which provides an overview of the architectural variety of structures which make up the residential environment. Buildings were classified as one, two, three, or four or more stories. More than 85 percent of the total sample population reside in one or two story structures with one story being equally as popular as two story units.

Housing quality

The next set of three variables includes components of housing quality. All of them are multiple item additive scales that group a number of highly correlated single quality features into three encompassing variables which themselves are not highly correlated with one another and which measure slightly different aspects of quality. The quality variables are attempts to assess the quality of the dwellings exclusive of the neighborhood or location.

Completeness of insulation is the first to be considered and covers the following items: storm windows, number of inches of attic insulation,

storm doors, and wall insulation. All are coded either (0) none exist, (1) partial or (2) complete except for number of inches of attic insulation which can be (0) none, (1) one to four inches, or (2) five to eight inches. The code number represents the score for each item. The resulting completeness of insulation scale has a minimum possible score of zero and a maximum of eight.

The reliability test (Table 5) indicates that the completeness of insulation scale is good in terms of the combination of variables as in each case the alpha coefficient would decrease if an item is deleted from the scale. Of some concern is the fact that the alpha coefficient is below the "cut off" point of .65 therefore undue emphasis is not to be placed upon this variable in the analysis although its relationship to the independent variable is noted. The alpha coefficient and the standardized alpha are nearly equal which is a good indication.

Another housing quality variable is completeness of mechanical facilities. It includes a) whether or not a dwelling has hot and cold running water where (0) is none, (1) is cold running water only, and (2) is both hot and cold running water, b) whether or not the dwelling has (0) no, (1) shared, or (2) private kitchen facilities, c) none, shared, or private flush toilet and d) none, shared or private bathing facilities. Like the other variables mentioned this is an additive scale and the code indicates the score for each of the four items.

The test for reliability (Table 6) indicates that on the whole, the completeness of mechanical facilities scale is a reliable index. As with the preceding variable, however, one aspect of the test does not meet the

Table 5. Reliability of insulation scale

Variable	Item-total correlation	Alpha if item deleted
Completeness of storm windows	.157	.417
Number of inches of attic insulation	.239	.351
Completeness of storm doors	.226	.358
Completeness of wall insulation	.319	.248
Alpha = .420	Standardized alpha = .415	

Table 6. Reliability of mechanical facilities scale

Variable	Item-total correlation	Alpha if item deleted
Existence of hot and cold running water	.533	.557
Kitchen facilities	.447	.571
Toilet facilities	.499	.526
Bathing facilities	.407	.680
Alpha = .643	Standardized alpha = .709	

criteria set earlier. If the bathing facilities variable is deleted then the alpha is raised from .643 to .680. Note was taken of this and it was decided that even though an increase is not the ideal, an increase of .037 is not a critical error and therefore the scale is entered into the analysis as is. The alpha coefficient and the standardized alpha are similar in magnitude for this variable.

The third housing quality variable is number of structural and mechanical defects. The defects variable includes responses to the following items:

Are there defective floors?

Are there defective walls?

Are there defective windows?

Is the roof defective?

Is the heating system defective?

Is the plumbing defective?

All the above questions are dummy variables and involve either "yes" or "no" answers. The scale that was developed codes all "no" answers with a zero and all "yes" answers with a one. Thus the range of possible defects is from zero to six. Upon reviewing the tables in the reliability test (Table 7) it is found that structural and mechanical defects meet the criteria of a good scale. All the numbers in the correlation matrix are roughly in the same range, the two alpha coefficients (.679 and .684) are almost equal and are above the .65 "cut off" and the alpha does not rise when individual items are deleted from the scale. One may conclude that all

Table 7. Reliability of number of defects scale

Variable	Item-total correlation	Alpha if item deleted
Defective floors	.450	.628
Defective walls	.488	.613
Defective windows	.496	.604
Defective roof	.365	.658
Defective heating system	.309	.667
Defective plumbing	.376	.650
Alpha = .679	Standardized alpha = .684	

the variables used in the scale are contributing to the reliability of the scale.

Residential satisfaction

The last group of variables to be discussed is residential satisfaction and is comprised of two variables--neighborhood satisfaction and housing satisfaction. Both variables are scales that were developed by combining eight items each.

Neighborhood satisfaction includes the following items:

Satisfaction with location of neighborhood within the community.

Satisfaction with neighbors and neighborhood people.

Satisfaction with neighborhood children.

Satisfaction with the condition of other housing.

Satisfaction with the nearness to work.

Satisfaction with nearness to community services.

Satisfaction with nearness to schools.

Satisfaction with nearness to parks and recreation.

Five levels of satisfaction were offered as possible responses:

1) dislike very much

2) dislike

3) doesn't matter

4) like

5) like very much

When the eight items were combined they produced an additive scale with scores that could vary from 8 to 40 based upon the codes given for each response. Thus if a respondent was very dissatisfied with all of the aspects of the neighborhood then their score would be 8 or if they were very satisfied with all of the factors then they would be at the other end of the scale with the maximum possible score of 40.

The reliability test indicates that all of the items combine to make a very good scale to measure the level of neighborhood satisfaction. The alpha coefficient and the standardized alpha are fairly high at .714 and .717 respectively and the alpha is lowered when any of the eight items are deleted. In addition the correlation matrix gives figures which are within close range of each other.

Housing satisfaction (Table 9) is measured using similar items and coding procedures as neighborhood satisfaction. Eight variables concerned with the respondent's level of satisfaction with certain housing characteristics and structural features and conditions were combined. Each item

Table 8. Reliability of neighborhood satisfaction scale

Variable	Item-total correlation	Alpha if item deleted
Sat. location of nbhd. within community	.379	.691
Sat. neighbors-neighborhood people	.391	.689
Sat. neighborhood children	.454	.675
Sat. condition of other housing	.385	.690
Sat. nearness to work	.365	.695
Sat. nearness to community services	.486	.671
Sat. nearness to schools	.397	.688
Sat. nearness to parks and recreation	.394	.688
Alpha = .714	Standardized alpha = .717	

Table 9. Reliability of housing satisfaction scale

Variable	Item-total correlation	Alpha if item deleted
Number of rooms	.634	.548
Number of bedrooms	.588	.517
Floor plan	.620	.403
Physical condition of house	.643	.473
Comfort of home	.662	.458
Style and design of house	.694	.507
Image of the home	.581	.416
Size of lot	.398	.862
Alpha = .857	Standardized alpha = .858	

was coded (1) for very dissatisfied, (2) for dissatisfied, (3) for satisfied, or (4) for very satisfied. The variables used in this scale are:

Satisfaction with number of rooms.

Satisfaction with number of bedrooms.

Satisfaction with floor plan.

Satisfaction with physical condition of house.

Satisfaction with comfort of home.

Satisfaction with the style and design of the house.

Satisfaction with the image of your home.

Satisfaction with size of lot.

The results of the reliability test show that the housing satisfaction scale is excellent in terms of consistency among items. The range in the correlation matrix is close and the resulting alpha coefficients are large. The standardized alpha and the alpha coefficient are very similar with the former being .858 and the latter being .857. In the "alpha if item deleted" category one out of the eight items causes a rise in the magnitude of alpha. The variable at fault is satisfaction with size of lot. The degree to which the alpha is affected is minimal (.005) and therefore the researcher chose to retain the item.

Test for Multicollinearity

Initially a correlation matrix (Table 10) was obtained for variables that were being considered for inclusion in the analysis. After investi-

Table 10. Pearson product-moment correlations of all variables

Variable	1	2	3	4	5	6
Independent variable:						
1. Group I	-					
2. Group II Size of	-.22	-				
3. Group III community	-.21	-.36	-			
4. Group IV	-.27	-.46	-.44	-		
Exogenous variables:						
5. Age of the head household	-.07	.07	.07	-.08	-	
6. Socioeconomic class	-.06	.07	-.01*	-.02*	-.25	-
7. Size of household	.05	-.03*	-.03*	.02*	-.45	.21
8. Marital status of head	.06	.05	-.01*	-.07	-.28	.22
8. Length residence in community	-.03*	-.03*	-.01*	.05	.66	-.15
Housing characteristics:						
10. Single-family home ownership	.08	.07	.05	-.16	.19	.11
11. Number of rooms	.00*	.02*	-.04*	.02*	-.11	.31
12. Monthly value of housing services	-.07	.07	.01*	-.02*	-.04*	.43
13. Number of stores	-.06	-.08	-.06	.18	.02*	-.01*
Housing quality:						
14. Insulation	.07	.16	-.02*	-.18	-.01*	.22
15. Mechanical facilities	.00*	.08	.03*	-.10	-.08	.14
16. Structural & mechanical defects	.01*	-.02*	-.04*	.05	-.09	-.13
Residential satisfaction:						
17. Neighborhood satisfaction	-.02*	.12	.08	-.18	-.05	.21
18. Housing satisfaction	-.09	.01*	.09	-.04*	.18	.17

*Not significant at the .05 level.

7	8	9	10	11	12	13	14	15	16	17	18
-											
.45	-										
-.32	-.21	-									
.15	.24	.19	-								
.43	.32	-.04*	.34	-							
.13	.20	-.06	.18	.31	-						
.01*	-.17	.03*	-.23	.07	-.03*	-					
.08	.27	-.03*	.29	.15	.31	-.26	-				
.09	.14	.07	.08	.13	.13	-.06	.12	-			
.09	-.13	.05	-.17	-.01*	-.22	.09	-.34	-.11	-		
.13	.18	-.07	.18	.19	.23	-.06	.18	.14	-.12	-	
-.11	.05	.09	.20	.17	.34	-.07	.28	.08	-.31	.35	-

gation of the resulting table, appropriate variables were selected and were either used in scales or were considered to be important enough to stand alone as a single item variable.

The second major step was executed using all variables that were being considered for the analysis including the scales. The zero order correlations were reviewed to make certain that none of the variables were highly intercorrelated. The Pearson correlation coefficient r is used to measure the strength of relationship between two interval-level variables (Nie et al., 1975, p. 280).

One may conclude from the correlation matrix of all variables that the vast majority of the possible combinations have low levels of intercorrelation. Any exceptions to this are noted in the section on conceptual definitions for the variable concerned.

The Analysis

The variables were analyzed with respect to the data in a two part process-contingency table analysis and multiple regression analysis.

The initial analysis was carried out by crosstabulation which is a joint frequency distribution of cases according to two or more classificatory variables (Nie et al., 1975, p. 218). Certain statistical tests may be applied to joint frequency distributions to measure the significance of the crosstabulation in terms of its classifications. In this study, the chi-square statistic was used to determine whether or not the variables are statistically independent. In addition the distribution was summarized

by the ordinal correlation coefficient "gamma" which describes the degree to which ordinal positions on one variable predict or vary with those of the other.

For purposes of this thesis the criterion set for the statistical tests was, that in order for the crosstabulation to be considered significant, the level of significance of the chi-square must be less than .05 and the gamma must be greater than positive or negative .2.

An intermediate step in the overall analysis involves one-way analysis of variance. Of prime concern in this analysis are the means for each size of community as these are used as a method of comparison with the predicted means obtained in the multiple regression. The mean is a measure of central tendency and is defined as the sum of scores divided by the total number of cases involved (Blalock, 1960, p. 46).

The second major part of the total analysis involves multiple regression. This "can be conceptualized as a prediction problem in which we attempt to predict a dependent variable Y from the variables X_1, X_2, ..., X_k" (Blalock, 1960, p. 326) which are a number of independent variables. Multiple correlation refers to the amount of total variation in the dependent variable which can be explained by all of the independent variables acting together.

Multiple regression analysis involves a linear regression equation of the form

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k$$

where

Y = the dependent variable

α = value of Y when all X's are zero

$\beta_1, \beta_2 \ldots \beta_k$ = partial coefficients

$X_1, X_2 \ldots X_k$ = the dependent variables

The α and β's are constants which when combined in the equation with specific values of the independent variables permit estimation of the means for specific subgroups of the sample.

Regression analysis employs the criterion of least squares which "involves finding a unique straight line which has the property that the sum of the squares of the deviations of the actual Y values from this line is a minimum" (Blalock, 1960, p. 281). The new equation $\hat{Y} = a + b_1X_1 + b_2X_2 + \ldots + b_kX_k$ represents the best estimate of the regression equation.

The importance of individual variables may be indicated by their net regression coefficients. Beta coefficients, sometimes referred to as standardized regression coefficients or beta weights, indicate how much change in the dependent variable is produced by a standardized change in one of the independent variables when the others are controlled (Blalock, 1960). The beta coefficient is an expression of the unstandardized regression coefficient, b, for each variable corrected by the ratio of the standard deviations of a given independent variable and the dependent variable (Ezekiel & Fox, 1959, p. 196).

The coefficient of multiple correlation, R, measures the combined importance of the several independent factors as a means of explaining the differences in the dependent factor. The square of the coefficient of multiple correlation, R^2, is known as the coefficient of multiple

determination. "The overall accuracy of the prediction equation is reflected by R^2, the proportion of variation explained by the variables included in the regression equation" (Nie et al., 1975, p. 331). A high value of the R^2 is desriable in the present thesis.

An F test statistic is employed as the overall test for the goodness of fit of the regression equation. If the computed value of F is larger than the value of F as shown in the F table at a specified level of significance then it can be concluded that the independent variables concerned have a correlation with the dependent. For this study the 5 percent level of significance was used for evaluating obtained F ratios. The F statistic plays an important role in the regression analysis. The researcher chose to force the community size dummy variables into the equation regardless of their significance and at the same time eliminate the control variables from the equation that were not significant. The first step was a regression analysis of only the dummies for size of community. The additional steps involved a process of forward stepwise inclusion through which independent variables were entered only if they added a significant increment to the R^2. The order of inclusion is determined by the respective contribution of each variable to explained variance (Nie et al., 1975, p. 345). The statistical criteria for the analysis in this thesis was that the F ratio had to be larger than 3.85 (df = 1 and ca. 1260 at the .05 level) for each control variable to enter the equation. Based on the final regression, differences between the estimated means after the control variables are controlled can be compared with the first two stages of the analysis.

CHAPTER III. ANALYSIS

The analysis tests a covariance model of the effects of community size on housing characteristics, housing quality, neighborhood satisfaction, and housing satisfaction with controlled demographic and socioeconomic characteristics. First to be considered are crosstabulations of the demographic and socioeconomic characteristics with size of community as these variables, in the form of controls, will be entered into the regression equations of all the other variables to help eliminate the possibility of spurious relationships between community size and the housing and neighborhood variables. The demographic and socioeconomic variables will also be a useful tool in the clarification of the relationships among all the other variables.

The second portion of the analysis deals with the model as presented in Figure 1. Each crosstabulation is reviewed for each dependent variable and note is taken of the pattern portrayed when the dependent variable is broken into community-size groups. The first stage of the regression is similar to the crosstabulation analysis employing a slightly different method of testing in which the predicted means are obtained from the regression equation with and without the control variables.

The final step in the regression analysis is perhaps the most important table and the bulk of the discussion is focused upon these findings. If a relationship between a dependent variable and size of community is significant a schematic portrayal will be given wherein the symbol ">" indicates the community-size group on the left has a greater number or a greater degree of the dependent variable than does the community-size

group on the right of the sign. Similarly "≥" means that the community-size group on the left hand side of the sign is essentially equal to but statistically fractionally larger than the community-size group on the right of the sign in terms of characteristics of the dependent variable. An attempt will then be made to explain the pattern in relation to the variables involved in the equation and in terms of other variables in the larger data set which are known to have effects upon the relationships.

Exogenous Variables - Demographic and Socioeconomic Characteristics

Age of the head of the household (Table 11)

Upon reviewing the crosstabulation of the relationship of this variable to size of community it is found to be significant at the .05 level. The largest (Group IV) and smallest (Group I) communities have populations in which almost half of the heads of households are between 35 and 64 years of age. These two community-size groups also have a larger portion under the age of 35 than do families in the middle sized communities. Communities ranging in population from 2000-9999 (Group II and Group III) have about one-third of the heads of households over the age of 64.

Size of the household (Table 12)

The significance of the size of the household in its relation to size of community is marginal. Considering the correlation of household size and age of the head of the household it is not surprising to find that

Table 11. Age of the head of the household

	Size of community				
	(1) <2000	(2) 2000-4999	(3) 5000-9999	(4) 10000+	Total
	Percentage				
Under 35	30.6	21.9	24.4	27.8	25.7
35-64	48.6	45.1	42.3	48.1	45.8
Over 64	20.8	33.0	33.3	24.1	28.5
	100.0	100.0	100.0	100.0	100.0
Number of cases	144	342	324	453	1263
Average	47.2	53.2	53.2	49.1	51.1

Significant at .05 level

there is a reverse pattern for the crosstabulation of size of household with community size as compared to the pattern evident in the age of the head of household crosstabulation. The smallest community-size group (I) has younger heads of households (Table 11) and a larger household size and the largest community (Group IV) has a fair number of households with more than two adults which increases the total size of the household (Table I-9 in Morris et al., 1977, p. 16).

Marital status of the head of the household (Table 13)

The smallest community-size group (I) has the greatest percentage of currently married heads of households and the Group IV (population of 10000 and over) has the smallest percentage of currently married heads and the highest percentage of separated and divorced. In this sample

Table 12. Number of persons in household

	Size of community				
	(1)	(2)	(3)	(4)	
	< 2000	2000-4999	5000-9999	10000+	Total
	Percentage				
One	14.6	18.6	21.6	22.9	20.4
Two	32.6	40.7	35.2	34.1	36.0
Three	18.1	11.9	14.15	13.6	13.9
Four	16.7	14.2	14.8	11.6	13.7
Five	10.4	9.0	7.7	8.6	8.7
Six or more	7.6	5.6	6.2	9.2	7.3
	100.0	100.0	100.0	100.0	100.0
Number of cases	144	344	324	455	1267
Average	3.0	2.7	2.7	2.9	2.8

Marginal significance at .05 level

increasing population-size groups display a greater proportion of currently not married heads of households which includes those who never married, are separated, divorced or widowed. This relationship is significant at the .05 level.

Socioeconomic class (Table 14)

This variable was created by combining the education of the head of the household, the total household income and the occupation of the head of the household into a scale where three was the minimum number of points possible and nine was the maximum score. Socioeconomic class was found to

Table 13. Marital status of the head of the household

	Size of community				
	(1) <2000	(2) 2000-4999	(3) 5000-9999	(4) 10000+	Total
	Percentage				
Married	77.7	74.4	65.4	66.1	70.5
Never married	5.6	4.2	5.9	10.8	7.3
Separated	0.7	0.0	0.3	2.6	1.1
Divorced	2.8	3.2	5.9	5.5	4.7
Widowed	13.2	17.7	18.5	15.0	16.4
	100.0	100.0	100.0	100.0	100.0
Number of cases	144	344	324	453	1265
Significant at .05 level					

be significantly related to community size at the .05 level in terms of its relationship to size of community.

All communities have a fairly evenly distributed and wide range of socioeconomic levels, however, towns in the population category of 2000-4999 (Group II) are above the total sample average in level of socio-economic class and the smallest communities (Group I) exhibit slightly below the average socioeconomic status. For the crosstabulation of the three variables which make up socioeconomic class consult Morris et al. (1977).

Table 14. Socioeconomic class scale

	Size of community (1) <2000	(2) 2000-4999	(3) 5000-9999	(4) 10000+	Total
			Percentage		
Low 3	10.5	9.9	16.5	14.6	13.3
4	13.3	10.5	11.0	8.9	10.4
5	25.9	18.7	18.2	19.6	19.8
6	18.9	14.2	12.0	18.9	15.9
7	16.8	19.0	19.6	15.5	17.6
8	9.1	15.7	10.7	10.5	11.8
High 9	5.6	12.0	12.0	12.1	11.3
	100.0	100.0	100.0	100.0	100.0
Number of cases	143	332	291	439	1205
Average	5.7	6.2	6.0	6.0	6.0

Significant at .05 level

Length of residence in community since marriage (Table 15)

The significance of this relationship is marginal at the 95% level of confidence. The results of the crosstabulation however indicate an interesting pattern. Most of the households in the sample have resided in the community that they are now living in for twenty years or more. The largest community (Group IV) has the longest average length of residence and as the population groups decrease in size the average number of years decreases in terms of the length of residence in the community. There is

Table 15. Length of residence in community since marriage

	Size of community (1) <2000	(2) 2000-4999	(3) 5000-9999	(4) 10000+	Total
			Percentage		
Less than 5 yrs	31.3	25.9	29.1	24.0	26.6
5 through 9 yrs	16.0	18.1	13.0	11.6	14.2
10 through 19 yrs	16.7	21.6	20.1	20.2	20.2
More than 19 yrs	36.1	34.4	37.8	44.2	39.0
	100.0	100.0	100.0	100.0	100.0
Number of cases	144	343	323	455	1265
Average	16.4	17.1	17.7	19.0	17.9

Marginal significance at .05 level

a fair number of young married newcomers with families in the smaller communities and it appears that a large number of this specific populace commute to other locations for employment purposes (Morris et al., 1977), Table I-16 and I-20). For those persons who are not married the length of residence in this community was taken from the age of 20.

Conclusions

The analysis to this point indicates that age of the head of the household, marital status, and socioeconomic class clearly differ by community size. There are marginal differences by community size in household size and length of residence in this community. All of these can be seen to have potential implications for the need for certain housing

characteristics, for the need for a certain level of quality and for the satisfaction that might be derived. Therefore in the analysis of the differences by community size of housing characteristics, quality, and satisfaction it would be risky to ignore the control variables.

Housing Characteristics

The housing characteristics of single-family homeownership, number of rooms, monthly value of housing services, and number of stories are being tested to see if there are differences in their relationship to size of community. The raw data are examined first and then consideration is given to the differences found in the relationships controlling for exogenous variables. Lastly the overall significance of housing characteristics is reported.

Single-family homeownership

The relationship of single-family homeownership to size of community is significant at the .05 level as seen in the crosstabulation. Single-family homeowners have been coded 1 and other structure types and tenure forms have been coded 0. Upon reviewing the percentages for the four categories of community size a trend is evident in that the smallest community-size group (I) indicates an average of .83 percentage and the averages of the other community-size groups decreases from this point in the same rank order as do the population sizes of the groups with Group II (population range of 2000-4999) and Group III (population range of 5000-9999) having similar percentages (.78 and .77 respectively) and the largest community-size group having a percentage of .64.

Table 16. Single-family homeownership

	Size of community				
	(1)	(2)	(3)	(4)	
	<2000	2000-4999	5000-9999	10000+	Total
	Percentage				
0) Not single-family homeowners	17.4	22.1	23.1	36.3	26.9
1) Single-family homeowners	82.6	77.9	76.9	63.7	73.1
	100.0	100.0	100.0	100.0	100.0
Number of cases	144	344	324	455	1267
Average	83.	78.	77.	64.	73
Predicted average	82.	78.	75.	62.	-
Pred. Avg. controlling other variables	84.	75.	74.	64.	-

Significant at .05 level

Analyzing the regression tables of single-family homeownership with community size and controlling for the influence of demographic variables the findings support the negative correlation found in the original relationship which indicates that there is a greater number of single-family homeowners in the smaller community-size group than in the communities with larger populations with the largest community-size group (IV) having the smallest proportion of single-family homeowners.

The R^2 obtained in the final step of the regression is .201 and is significant at the .05 level. The following variables entered the

Table 17. Regression analysis of single-family homeownership on all variables

Variable	b	Beta	F
Marital status	0.239	.239	60.091
Length residence in this dwelling since marriage	0.005	.165	20.185
Age of the household head	0.006	.249	39.395
Size of household	0.049	.179	29.986
Socioeconomic class	0.024	.098	11.530
Community size I	0.200	.142	22.880
Community size II	0.117	.117	13.803
Community size III	0.108	.102	10.785
Constant -0.192			
R^2 = .201	df = 8 & 1074		
F = 33.833	p < .05		

equation: marital status of the head of the household, length of residence in the community since marriage (or since age 20 if not currently married), age of the head of the household, size of the household, and socioeconomic class. The regression shows that being married, living a long time in the community, being older, having a larger household size, and being in a higher socioeconomic class increases the likelihood of

being a single-family homeowner. The trend mentioned earlier remains the same, however, as it progresses through the stages of the regression the pattern in terms of the relative proportions of the presence of single-family homeowners in population groups is:

Group I (<2000) > Group II (2000-4999) > Group III (5000-9999) > Group IV (10000+)

With respect to the community size breakdown there appears to be a positive correlation between the age of the head of the household and socioeconomic class and a negative correlation between these two variables and size of the household. Communities with the older household head, higher socioeconomic class and smaller household size in comparison to the average for the entire population range are in the middle of the population scale (Group II and Group III) and have slightly above average single-family homeownership (Tables 11, 12, and 14).

The smaller communities (Group I) are characterized by a greater number of currently married heads of households, greatest household size, a lower level on the socioeconomic class scale, and appear to have the greatest number of single-family homeowners. Considering other variables such as location of employment of head of household and length of residence in this dwelling as seen in The Assessment of Housing Needs and Conditions in Small Cities and Towns of Iowa (Morris et al., 1977) from which data for this thesis is taken, it would seem that there is a relatively large number of young married couples with small children who have recently settled in small communities and are commuting to place of employment. The largest community size group (Group IV) is below the total sample average in heads of households who are currently married and is above the

average (17.9) regarding the number of years of residence in community since marriage and this group has the lowest number of single-family homeowners. One might speculate that an explanation of this may be that some persons in Group IV (e.g., widows) may be homeowners, however, not necessarily of single-family units as perhaps they rent out a portion of the house to others. In addition, the higher number of single-family homeowners in the smallest community-size group (Group I) may be a reflection of the housing market in that rental units in small towns have not traditionally been plentiful. Additional support for these notions is obtainable by referring to The Assessment of Housing Needs and Conditions in Small Cities and Towns of Iowa (Morris et al., 1977) for crosstabulations of these and other related variables.

Number of rooms in dwelling

The relationship of community-size groups to the total number of rooms in a dwelling minus utility rooms and baths is not significant at the .05 level. The average number of rooms per dwelling for each of the four population groups is very similar and the pattern between community-size groups appears uniform in direction in that there are very few one and two room dwellings (.8 percent), a few three room units (6.2 percent), a moderate number of four room, seven, and eight room dwellings (43.7 percent). The largest percentage of dwellings is in the categories of five and six room dwellings (49.3 percent).

Table 18. Total number of rooms in dwelling minus utility and baths

	Size of community				
	(1) <2000	(2) 2000-4999	(3) 5000-9999	(4) 10000+	Total
	Percentage				
One	0.0	0.0	0.3	0.4	0.2
Two	0.0	0.0	0.6	1.1	0.6
Three	6.3	3.2	5.6	8.8	6.2
Four	16.0	17.2	18.3	17.4	17.4
Five	24.3	27.0	27.2	21.1	24.6
Six	29.1	28.8	22.9	21.5	24.7
Seven	15.3	12.8	16.7	14.5	14.7
Eight	9.0	11.0	8.4	15.2	11.6
	100.0	100.0	100.0	100.0	100.0
Number of cases	144	344	323	455	1266
Average	5.6	5.7	5.5	5.7	5.6
Predicted average	5.7	5.7	5.5	5.6	-
Pred. Avg. controlling other variables	5.6	5.6	5.5	5.7	-

Not significant at .05 level

The regression tables of number of rooms in dwelling with size of community, controlling for the influence of demographic variables, indicate that Group IV (population of 10000 and over) has slightly above average number of rooms per dwelling, Group I (less than 2000 population) has communities with slightly below the average number of rooms, and the middle range community-size groups (II and III) are representative of the average which is 5.6 rooms in a dwelling.

Table 19. Regression of number of rooms in dwelling on all variables

Variable	b	Beta	F
Size of household	0.371	.383	151.263
Socioeconomic class	0.219	.249	80.891
Age of the household head	0.013	.152	25.858
Marital status of head	0.441	.125	17.891
Community size I	-0.042	-.008	0.087
Community size II	-0.058	-.017	0.308
Community size III	-0.175	-0.047	2.531
Constant 2.359			
R^2 = .266	df = 7 & 1075		
F = 55.629	p < .05		

The R^2 from the final stage of the regression analysis is .266 and is significant at the 95 percent level of confidence. Size of household, socioeconomic class, age and marital status of the head of the household are the four control variables that entered the equation. The regression shows that being older and currently married has a fairly weak positive correlation with number of rooms in dwelling and that larger household size and higher socioeconomic class displays a moderate positive correlation with the number of rooms in a dwelling.

Because of the high degree of similarity between community-size groups and this dependent variable, the independent variable (community size) does not suggest a definite trend in the pattern of number of rooms in dwelling.

Monthly value of housing services

The crosstabulation of the relationship of monthly value of housing services (the dependent variable) to size of community is significant at the .05 level. (Note that the significance changes to not significant when analyzed by multiple regression.)

The averages for the various community-size groups are quite similar and a definite trend of differences between groups is not apparent due to this factor. Upon closer examination of the crosstabulation it appears that there is a relatively evenly distributed wide range of monthly values of housing services among and between the four community-size groups.

Table 20. Monthly value of housing services

	Size of community (1) < 2000	(2) 2000-4999	(3) 5000-9999	(4) 10000+	Total
			Percentage		
1) $0.00 to $69.99	25.0	22.1	18.5	18.9	20.4
2) $70.00 to $129.99	42.4	36.6	39.2	42.2	39.9
3) $130.00 to $375.00	20.1	35.8	29.0	28.6	29.7
4) Missing cases	12.5	5.5	13.3	10.3	10.0
	100.0	100.0	100.0	100.0	100.0
Number of cases	126	325	281	408	1140
Average	99.31	117.89	112.19	110.10	111.64
Predicted average	98.51	115.09	108.16	109.25	-
Pred. Avg. controlling other variables	102.06	110.56	108.77	111.91	
Not significant at .05 level					

The regression tables with the introduction of demographic variables reduces monthly value of housing services to an insignificant level and the lack of clear variation of the dependent variable by size of community remains.

The R^2 from the last step in the regression is .207 and is significant at the .05 level. The variables that entered the equation are socio-economic class, marital status of the head of the household, and age of

Table 21. Regression analysis of monthly value of housing services on all variables

Variable	b	Beta	F
Socioeconomic class	13.686	.421	215.540
Marital status of head	17.705	.135	22.122
Age of the household head	0.289	.095	10.456
Community size I	-9.853	-.054	3.303
Community size II	-1.348	-.010	0.111
Community size III	-3.140	-.023	0.550
Constant 2.142			
R^2 = .207	df = 6 & 1076		
F = 46.827	p < .05		

the head of the household. The regression suggests that the households in the higher socioeconomic class, households with currently married heads, and those with older heads are likely to have a higher monthly value of housing services. With respect to community-size groups, however, the trends are so weak that a diagrammatic representation may only be misleading. Variations in monthly value of housing services within communities is so great there is no significant variation between communities.

Number of stories in this building

The relationship of the number of stories to size of community is significant at the .05 level as revealed in the crosstabulation. The

Table 22. Number of floors in this building

	Size of community (1) <2000	(2) 2000-4999	(3) 5000-9999	(4) 10000+	Total
	Percentage				
One	51.4	49.5	47.2	40.2	45.8
Two	47.9	48.7	50.6	48.2	48.0
Three	0.7	1.5	2.2	8.6	4.1
Four or more	0.0	0.3	0.0	3.0	1.3
	100.0	100.0	100.0	100.0	100.0
Number of cases	144	343	324	453	1264
Average	1.5	1.5	1.6	1.8	1.6
Predicted average	1.5	1.5	1.5	1.8	-
Pred. Avg. controlling other variables	1.5	1.6	1.5	1.8	-

Significant at .05 level

averages indicate that by far the majority of households reside in structures which are either one story (45.8 percent) or two stories (48.0 percent). A relationship is apparent in terms of the different community-size groups in that Group I (population of less than 2000) has the largest number of one story dwellings (51.4 percent) and the smallest number of two story units (47.9 percent) and very few residential buildings with three stories. Group IV (population of over 10000) is on the other end of the continuum with the fewest number (40.2 percent) of one story dwellings

and a much greater number of three or more story units (11.6 percent) than the other community-size groups. The two middle range community-size groups (Group II and Group III) are similar in terms of the distribution of households in the scale of number of stories in this building and Group II and Group III also share the middle ranking in the pattern portrayed by the crosstabulation.

Analyzing the regression tables of number of stories in this building with community size and controlling for the influence of demographic variables, the outcome supports the positive correlation found in the original relationship which indicates that the smaller community-size groups tend to have fewer multistory residential structures than does the largest community-size group (Group IV) with Group I having almost completely one and two story dwellings.

Table 23. Regression analysis of number of stories in dwelling on all variables

Variable	b	Beta	F
Marital status	-0.330	-.200	37.426
Size of household	0.049	.109	11.235
Community size I	-0.295	-.127	15.976
Community size II	-0.253	-.155	21.374
Community size III	-0.272	-.156	22.183
Constant 1.897			
R^2 = .070	df = 5 & 1077		
F = 16.303	p < .05		

The R^2 obtained in the final step of the regression is .07 and is significant at the .05 level. The following two variables entered the equation: marital status of the head of the household and size of the household. The regression indicates that being a currently married head of the household reduces the probability of living in a multiple story building and that larger household sizes are weakly associated with dwellings having more than one story.

The addition of the control variables does not modify the pattern indicated by the crosstabulation and thus the pattern of the number of stories in a residential building in proportion to population groups is:

$$\begin{matrix}\text{Group IV} \\ (10000+)\end{matrix} > \begin{matrix}\text{Group II} \\ (2000\text{-}4999)\end{matrix} \geq \begin{matrix}\text{Group III} \\ (5000\text{-}9999)\end{matrix} > \begin{matrix}\text{Group I} \\ (<2000)\end{matrix}$$

As one would expect Group IV has more multiple story housing structures than the other community-size groups. The number of currently married heads of households tends to decrease as the population of the groups gets larger (Table 13), however, the factor of size of the household offers no clear directions in this sample.

Conclusions

Reviewing the relationships found in the crosstabulations of size of community to housing characteristics it was found that the single-family homeownership dummy variable and the number of stories in this building were the only characteristics of four variables that had significant relationships with the community size dummy variables. Controlling for exogenous variables did not alter the significance of the relationship of size of communities to the dependent variables. Single-family homeowner-

ship is influenced by all five exogenous variables--age and marital status of the head of the household, socioeconomic class, size of the household, and length of residence in this community--while number of stories is only affected by marital status and size of the household in this analysis.

Housing Quality

The housing quality variables of completeness of insulation, completeness of mechanical facilities, and number of structural and mechanical defects are tested in a similar manner as were the housing characteristics variables to see if they differ by community size.

Completeness of insulation

The relationship of insulation to size of community is significant at the 95% level of confidence as seen in the crosstabulation. A scale from zero to eight indicates the degree of completeness of the following insulation items: storm windows, attic insulation, storm doors, and wall insulation. A trend is evident among the four community-size groups in that 1) communities with populations under 5000 (Group I and Group II) display a higher degree of completeness of insulation (averages of 6.0 and 6.1 respectively on the scale) than the total sample average (5.7), 2) Group III (population between 5000 and 9999) appears to have a representative proportion of insulation items (5.7) and 3) the largest community-size group (Group IV) has below (5.3) the sample average in terms of degree of completeness of insulation.

Table 24. Completeness of insulation

	Size of community				
	(1)	(2)	(3)	(4)	
	<2000	2000-4999	5000-9999	10000+	Total
	Percentage				
Zero	0.0	0.3	0.3	0.9	0.5
One	0.0	0.6	0.3	2.4	1.1
Two	4.9	0.6	2.6	6.2	3.6
Three	4.9	4.2	6.8	9.2	6.7
Four	9.9	7.7	13.4	14.5	11.8
Five	12.0	14.5	14.7	12.6	13.6
Six	19.7	30.6	33.9	26.3	28.6
Seven	27.5	20.2	15.0	16.6	18.5
Eight	21.1	21.4	13.0	11.4	15.7
	100.0	100.0	100.0	100.0	100.0
Number of cases	142	337	307	422	1208
Average	6.0	6.1	5.7	5.3	5.7
Predicted average	6.0	6.1	5.6	5.3	-
Pred. avg. controlling other variables	6.1	6.1	5.6	5.4	-

Significant at .05 level

Investigating the regression tables of insulation with size of community and controlling for demographic variables the findings support the negative correlation found in the original relationship which indicates that there is a greater degree of completeness of insulation in the smaller community-size groups than in the groups with larger communities with the largest community-size group (Group IV) having a predicted average below all the other communities.

Table 25. Regression analysis of completeness of insulation on all variables

Variable	b	Beta	F
Marital status	0.894	.233	63.356
Socioeconomic class	0.190	.200	47.686
Age of the household head	0.010	.112	14.186
Community size I	0.715	.136	20.526
Community size II	0.692	.180	32.640
Community size III	0.232	.057	3.372
Constant 3.052			
R^2 = .142	df = 6 & 1135		
F = 31.242	p < .05		

The R^2 of .142 in the final stage of the regression analysis is significant at the .05 level. Combination influences of age and marital status of the head of the household and socioeconomic class entered the equations in the regression process. The regression suggests that households with older and currently married heads of a higher socioeconomic class level will more likely have housing with a greater degree of completeness of insulation. The relationship mentioned earlier, however, remains the same as it progresses through the stages of the analysis and the resulting pattern is:

Group I (<2000) $\geq$ Group II (2000-4999) $>$ Group III (5000-9999) $>$ Group IV (10000+)

With respect to the community size breakdown, communities with older heads of households and a higher socioeconomic class level in comparison to the average for the entire population range are in the middle of the population scale (Group II and Group III). It is noted that the F test indicates that statistically Group III does not differ from Group IV.

The smaller communities (Group I) are characterized by a greater number of currently married heads of households and a lower level of socioeconomic class and appear to have the greatest degree of insulation items which are considered complete. The largest community-size group (Group IV) is below the total sample average in heads of households who are currently married (Table 13) and has the lowest degree of completeness of insulation. One might speculate that because there are proportionately fewer single-family homeowners in Group IV (Table 16) that it is the renters who are lacking complete insulation.

Completeness of mechanical facilities

The crosstabulation of the relationship of mechanical facilities to size of community is significant at the .05 level.

Table 26. Completeness of mechanical facilities

	Size of community				
	(1) <2000	(2) 2000-4999	(3) 5000-9999	(4) 10000+	Total
	Percentage				
Zero	0.0	0.0	0.3	0.2	0.2
One	0.0	0.0	0.0	0.0	0.0
Two	0.0	0.0	0.0	0.0	0.0
Three	0.7	0.0	0.3	0.2	0.2
Four	0.0	0.3	0.0	0.4	0.3
Five	0.7	0.3	0.0	0.4	0.3
Six	1.4	0.3	1.5	4.4	2.2
Seven	1.4	0.0	0.3	2.0	0.9
Eight	95.8	99.1	97.5	92.1	95.8
	100.0	100.0	100.0	100.0	100.0
Number of cases	144	344	323	454	1265
Average	7.9	8.0	7.9	7.8	7.9
Predicted average	7.9	8.0	7.9	7.8	-
Pred. avg. controlling other variables	7.9	8.0	7.9	7.8	-

Significant at .05 level

As with insulation a scale of zero to eight was used to indicate the degree of completeness of facilities. The averages obtained for the four community-size groups are very similar and it indicates that almost all households in the sample have complete and private kitchen facilities, hot and cold running water, private flush toilet, and a private tub and/or shower.

Analyzing the regression tables for completeness of mechanical facilities with size of community and controlling for the influence of demographic variables it is apparent that the additional variables do not affect the pattern of similarity between the different community-size groups as found in the original relationship.

Table 27. Regression analysis of completeness of mechanical facilities on all variables

Variable	b	Beta	F
Marital status	0.164	.124	17.221
Socioeconomic class	0.037	.113	14.332
Community size I	0.082	.045	2.043
Community size II	0.139	.105	10.087
Community size III	0.094	.066	4.239
Constant 7.481			
R^2 = .046	df = 5 & 1136		
F = 10.869	p < .05		

The R^2 obtained in the final step of the regression is .046 and is significant at the .05 level. The following variables entered the equations of the regression as combination influences on mechanical facilities itself and/or as influences on the degree of completeness of mechanical facilities and its relation with size of community: marital status of the head of the household and socioeconomic class. The regression shows that being currently married and being in a higher socioeconomic class than the average household increases the likelihood of having complete mechanical facilities.

Due in part to the homogeneity of the sample in terms of the dependent variable the influence of the demographic variables have not altered the pattern obtained in the crosstabulation. Group IV (population of 10000 and over) is the only community which has below the average degree of completeness of mechanical facilities however the F test reveals that Group I is not significantly different than Group IV. This indicates that the averages are somewhat misleading due to the effect of rounding off the numbers.

Total number of structural and mechanical defects

Upon evaluating the crosstabulation of size of community with the number of structural and mechanical defects the results are only marginally significant. As with mechanical facilities the differences between the community-size groups and the average number of defects is negligible except for Group IV which has a slightly greater number of defects (0.4) than the total sample average (0.3). Eighty-two percent of the households

Table 28. Total number of structural and mechanical defects

	Size of community (1) < 2000	(2) 2000-4999	(3) 5000-9999	(4) 10000+	Total
			Percentage		
None	77.0	80.5	86.4	81.5	82.0
One	15.3	12.8	6.2	9.2	10.1
Two	4.9	4.7	4.6	3.5	4.3
Three or more	2.8	2.0	2.8	5.8	3.6
	100.0	100.0	100.0	100.0	100.0
Number of cases	144	344	324	455	1267
Average	0.3	0.3	0.3	0.4	0.3
Predicted average	0.3	0.3	0.3	0.4	-
Pred. avg. controlling other variables	0.3	0.3	0.3	0.4	-

Marginal significance at .05 level

display no mechanical and structural defects at all. The regression analysis does not reveal any change in the trend found in the original relationship. Now, however, the relationship of the dependent variable to community size is not significant at the .05 level.

The R^2 of .072 is still considered significant in terms of the overall F ratio in the last stage of the regression process. Four demographic variables entered the equation: age and marital status of the head of the household, size of household and socioeconomic class. The older,

Table 29. Regression analysis of total number of structural and mechanical defects on all variables

Variable	b	Beta	F
Marital status	-0.391	-.209	41.826
Size of household	0.084	.164	22.331
Socioeconomic class	-0.066	-.143	22.220
Age of the household head	-0.005	-.002	9.964
Community size I	-0.050	-.020	0.397
Community size II	-0.032	-.017	0.268
Community size III	-0.054	-.027	0.705
Constant 1.027			
R^2 = .072	df = 7 & 1134		
F = 12.532	p < .05		

married, smaller sized and higher socioeconomic status households have fewer defects in their dwellings. The regression indicates that size of the household is positively correlated to number of mechanical and structural defects in a dwelling and marital status, age of the head of the household and socioeconomic status have a negative correlation in relation to the total number of defects.

All the averages obtained suggest, as do the degree of mechanical facilities, that all community-size groups have about equal housing conditions with only Group IV straying from the typical to the rank below

the average. The F test shows that the four community-size groups are not significantly different.

Conclusions

The analysis indicates that completeness of insulation and completeness of mechanical facilities clearly differ by community size. There are marginal differences by community size in the number of structural and mechanical defects. Marital status and socioeconomic class entered into the regression equations of all three dependent housing quality variables. Both control variables have a positive correlation with completeness of insulation and mechanical facilities, and a negative correlation with number of structural and mechanical defects. Age of the head of the household has a positive relationship with completeness of insulation and a fairly weak negative correlation with number of defects. Size of household is influential only in terms of the number of defects and its relation to size of community and the result is a somewhat weak positive relationship.

Residential Satisfaction

Residential satisfaction incorporates the concepts of neighborhood satisfaction and housing satisfaction. In terms of the causal model hypothesized earlier, neighborhood satisfaction is treated as an intervening variable between the community size dummies and housing satisfaction therefore the regression analysis for neighborhood satisfaction includes the same control variables as does the housing characteristics and housing quality variables.

The analysis of housing satisfaction, on the other hand, requires that all other variables--the community size dummies, the demographic and socioeconomic variables, the housing characteristics and housing quality variables, and the neighborhood satisfaction variable--be independent variables in the multiple regression.

Neighborhood satisfaction

The relationship of neighborhood satisfaction to size of community is significant at the 95% level of confidence. The crosstabulation has a

Table 30. Neighborhood satisfaction

	Size of community				
	(1)	(2)	(3)	(4)	
	< 2000	2000-4999	5000-9999	10000+	Total
			Percentage		
Low (1-31)	39.6	31.4	42.9	53.6	43.3
Medium (32)	28.5	23.3	12.3	16.7	18.7
High (33-40)	31.9	45.3	44.8	29.7	38.0
	100.0	100.0	100.0	100.0	100.0
Number of cases	144	344	324	455	1267
Average	31.7	32.5	32.4	31.0	31.8
Predicted average	31.7	32.4	32.3	30.9	-
Pred. avg. controlling other variables	31.7	32.3	32.3	31.0	-

Significant at .05 level

breakdown of three groups: 1) those with scores of 31 or less (generally very dissatisfied to doesn't matter), 2) respondents with scores of 32 (generally satisfied), and 3) those having scores of 33 to 40 (generally very satisfied). Community-size Group I is the only one that displays a fairly even distribution between all three score ranges. Group II has the largest percentage of very satisfied (45.3) and the least who are less than satisfied (31.4). Group III shows about an equal distribution in the lower than average scores (42.9) group as in the above average score group (44.8) and Group IV has the greatest percentage less than satisfied respondents (53.6). There appears to be a much larger unit of measurement as one approaches the very low end of the scale; one or two points lower in the scale in that portion represents great increments in dissatisfaction.

Analyzing the regression tables for level of neighborhood satisfaction and its relation to community size and the influence of demographic and socioeconomic variables it is found that there is statistically a difference in level of neighborhood satisfaction between the different community-size groups with Groups I, II, and III all having significantly higher satisfaction than Group IV. However, the correction for the control variables results in almost no change in the predicted averages for neighborhood satisfaction.

The R^2 is .092 in the final step of the regression and is significant at the .05 level. Two variables entered the equations as influences upon the dependent variable. These variables are level of socioeconomic class

Table 31. Regression analysis of neighborhood satisfaction on all variables

Variable	b	Beta	F
Socioeconomic class	0.344	.174	37.699
Marital status	1.065	.135	22.469
Community size I	0.712	.064	4.576
Community size II	1.324	.164	27.638
Community size III	1.300	.159	24.895
Constant 28.159			
R^2 = .092	df = 5 & 1191		
F = 24.253	p < .05		

and marital status of the head of the household. The regression indicates that there is a positive correlation between being currently married and being in a high socioeconomic status position and neighborhood satisfaction. With respect to community size breakdown the pattern that has developed with neighborhood satisfaction appears as follows:

$$\begin{matrix}\text{Group II} \\ (2000\text{-}4999)\end{matrix} = \begin{matrix}\text{Group III} \\ (5000\text{-}9999)\end{matrix} > \begin{matrix}\text{Group I} \\ (<2000)\end{matrix} > \begin{matrix}\text{Group IV} \\ (10000+)\end{matrix}$$

Note that Group II and Group III display "equal" levels of neighborhood satisfaction (32.3) with the smallest community-size group (Group I) following with 31.7 and Group IV, the largest population, ranking last (31.0) in terms of predicted average after accounting for other variables.

The relationship evident between socioeconomic class and community size (Table 14) corresponds to a certain degree with the trend suggested by neighborhood satisfaction in that community-size groups with a higher than average socioeconomic class level also exhibit a higher than average level of satisfaction with the neighborhood. These trends are not profound by any means due to the lack of substantial differences between the four community size groups, however, the relationship has been mentioned as it supports the earlier findings of socioeconomic class and its relation to neighborhood satisfaction.

Housing satisfaction

The relationship of community size with level of housing satisfaction is significant at the .05 level. As with neighborhood satisfaction, housing satisfaction is broken into three categories. Scores from 1 to 23 are coded 1, a score of 24 has a code 2 and 25 through 35 have been coded with 3. Group I has a much larger percentage (41.7) of less than satisfied households than the other community-size groups with the satisfied category ranking second (30.6) and very satisfied in the third position (27.8). Group III has an equal number of cases (24.8) in the less than satisfied and the satisfied categories and has the greatest percentage (50.5) of very satisfied respondents. Community-size groups II and IV are more representative of the total sample averages than are the other two groups with respect to the relative distribution of cases within each score range.

The regression analysis discloses that with only size of community entering into the equation (step 1 of the regression) the level of housing

Table 32. Housing satisfaction

	Size of community				
	(1) <2000	(2) 2000-4999	(3) 5000-9999	(4) 10000+	Total
			Percentage		
Low (1-23)	41.7	30.6	24.8	30.1	30.2
Medium (24)	30.6	20.9	24.8	29.8	26.2
High (25-35)	27.8	48.5	50.5	40.1	43.6
	100.0	100.0	100.0	100.0	100.0
Number of cases	144	340	323	449	1256
Average	24.0	24.9	25.3	24.6	24.8
Predicted average	24.0	24.8	25.2	24.7	-
Pred. avg. controlling other variables	24.3	24.3	25.0	25.0	-

Significant at .05 level

satisfaction appears to be slightly above the total sample average (24.8) for community-size Groups II with 24.9 (population of 2000-4999) and Group III (population of 5000-9999) with 25.2 and Group I is the only community-size group below (24.0) the average.

The R^2 for the final stage in the regression is .313 and is significant at the .05 level. A number of variables have entered into the analysis by this stage as significant influences in relation to level of housing satisfaction itself and also in terms of the dependent variable and its relationship with size of community. The variables that affect

Table 33. Regression analysis of housing satisfaction on all variables

Variable	b	Beta	F
Monthly value of housing services	0.011	.187	41.156
Number of structural and mechanical defects	-0.702	-.177	38.878
Neighborhood satisfaction	0.240	.258	86.186
Age of the household head	0.023	.129	19.143
Completeness of insulation	0.263	.135	20.903
Size of household	-0.359	-.173	28.755
Number of rooms in dwelling	0.256	.121	16.065
Community size I	-0.683	-.066	5.289
Community size II	-0.719	-.097	10.071
Community size III	0.002	.000	0.000
Constant 13.362			
R^2 = .313	df = 10 & 1017		
F = 46.244	p < .05		

the original relationship are: 1) monthly value of housing services, 2) total number of structural and mechanical defects, 3) level of satisfaction with neighborhood, 4) age of the head of the household, 5) completeness of insulation, 6) size of the household, and 7) total number of rooms in the dwelling (minus utility rooms and baths). Based upon these variables the regression implies that there is a positive correlation between a

greater monthly value of housing services, higher levels of neighborhood satisfaction, older age of the household, a greater degree of completeness of insulation, a greater number of rooms in dwelling and a higher degree of housing satisfaction. Conversely, lower levels of these variables appear to produce a lower level of satisfaction with one's housing. There is a negative correlation between the number of structural and mechanical defects, larger household size and level of housing satisfaction.

When considering the community size breakdown in light of the influencing variables, housing satisfaction fits the following pattern:

$$\begin{matrix}\text{Group IV} \\ (10000+)\end{matrix} = \begin{matrix}\text{Group III} \\ (5000\text{-}9999)\end{matrix} > \begin{matrix}\text{Group II} \\ (2000\text{-}4999)\end{matrix} = \begin{matrix}\text{Group I} \\ (<2000)\end{matrix}$$

As with many of the dependent variables already considered this pattern does not denote great differences between large and small communities, however, the slight variations are noteworthy. The F test supports the findings that Group III is not significantly different from Group IV. The larger community-size groups (Group III and Group IV) are characterized by slightly above the average levels of housing satisfaction, lower degrees of completeness of insulation and above the average monthly value of housing services. Groups I and II feature a slightly below average level of satisfaction with their housing, greater degree of completeness of insulation, and an average number of rooms in a dwelling. All of the other contributing variables do not present clear directions in terms of the community size dummies and housing satisfaction, however, reference can be made to Figure 4 and to Table 33 for the figures involved.

Conclusions

The analysis demonstrates that both neighborhood satisfaction and housing satisfaction differ somewhat by community size. As indicated earlier, the number of independent variables involved as potential influences in the regression analysis is different for the two residential satisfaction variables due to their positions in the causal model, therefore, the findings will be discussed separately.

Neighborhood satisfaction differs with levels of socioeconomic class and marital status of the head of the household as well as with variations in community-size groups. Both control variables are found to have a positive relationship to neighborhood satisfaction.

With reference to housing satisfaction, all the variables mentioned thus far have potential implications as illustrated in the causal model either as direct relationships with housing satisfaction or as intervening variables between the community size dummies plus the exogenous variables and level of housing satisfaction.

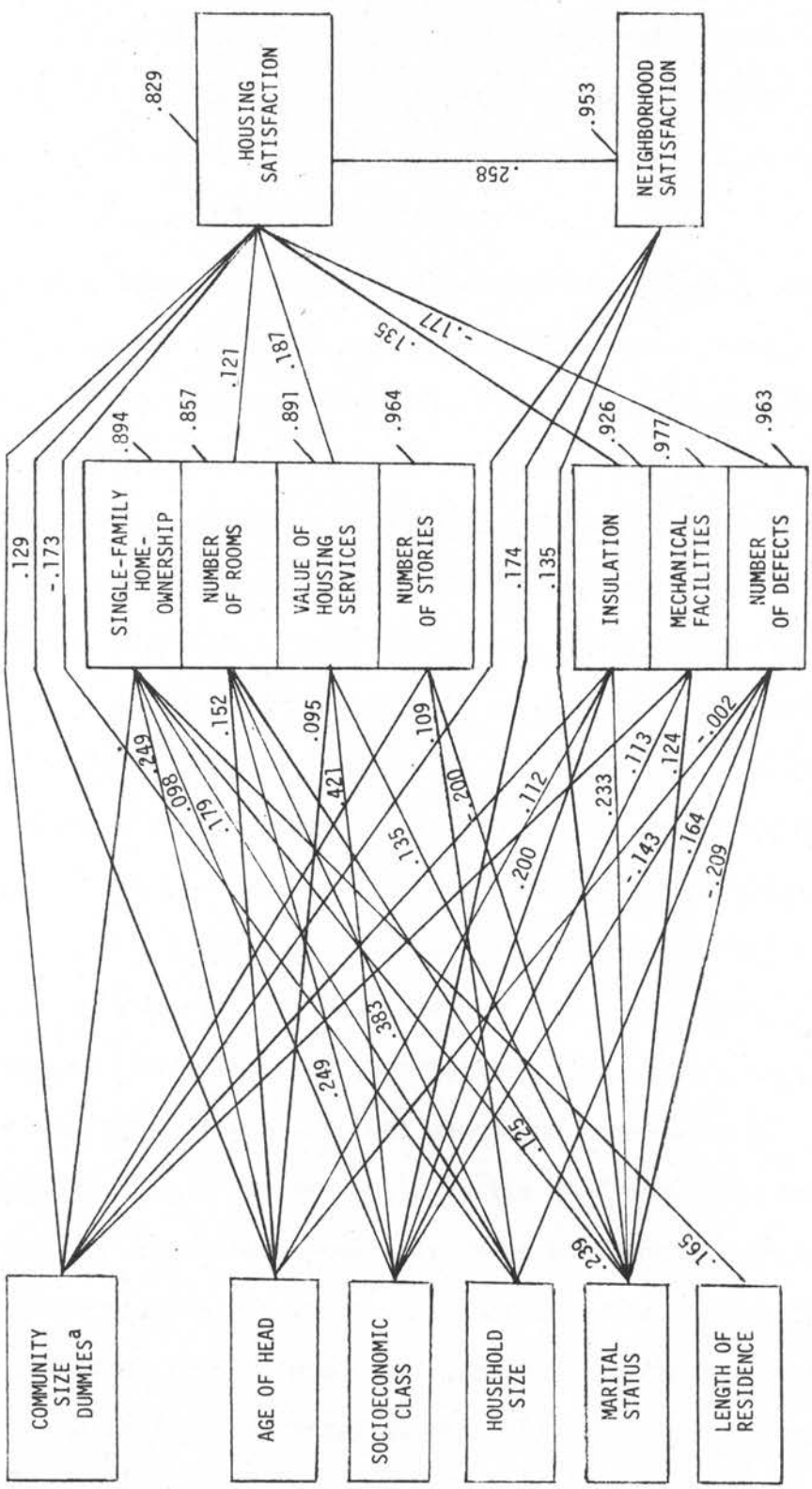
The results indicate that half of the potential variables entered the regression equations: Two were exogenous control variables (age of the head of the household and size of the household); two more were housing quality variables (number of structural and mechanical defects and completeness of insulation); another two variables came from the housing characteristics (monthly value of housing services and number of rooms in dwelling); and the neighborhood satisfaction was also included. All exhibited a positive relationship with housing satisfaction except for

number of structural and mechanical defects and size of the household which were negatively correlated to housing satisfaction.

Causal Diagram

The results of the complete regression analysis are diagrammed in Figure 4 and depict the various direct and indirect relationships among the variables. This does not represent the traditional path analysis causal model due to the covariance type of analysis. A line between two variables indicates that the variable raised the R^2 by an amount that was significant at the .05 level in a stepwise regression. The corresponding number is the standardized beta coefficient.

Inspection of the tested covariance model reveals a number of both expected and unexpected relationships in connection with housing satisfaction. Perhaps the most surprising aspects of the model are the variables which were thought to have the potential of intervening variables: single-family homeownership, number of rooms, value of housing services, number of stories, insulation, mechanical facilities, number of defects, and neighborhood satisfaction. Although five out of eight of these variables do have significant relationships with housing satisfaction only two appear to intervene between the community size dummies and housing satisfaction. These are completeness of insulation and neighborhood satisfaction. Of even more interest is the fact that single-family homeownership, number of stories in building, and completeness of mechanical facilities variables differ significantly in terms of the community-size groups and yet they do not appear to be related to housing satisfaction. Judging



[a]To avoid disorder the coefficients for the community size dummies are given in the regression tables only. These coefficients are interpreted differently from the others due to the covariance type of analysis performed and therefore are not appropriate in this figure. The arrows from community size indicate cases in which at least one of the community-size groups differ from the base class.

Figure 4. Diagram of tested covariance model.

from the material presented in the first chapter on the findings in the literature it is indeed somewhat puzzling that the single-family homeownership and the completeness of mechanical facilities variables do not correlate with housing satisfaction.

Possible explanations for this occurrence might be that the monthly value of housing services, which has the strongest correlation with housing satisfaction, is overriding the influences of some of the other variables. This seems plausible when one considers that monthly value of housing services probably incorporates the influence of a number of the other variables including single-family homeownership and completeness of mechanical facilities. Referring to the Pearson product-moment correlation (Table 10) there does appear to be a slight correlation between the variables indicated. The mechanical facilities variable may also owe some of the apparent noncorrelation with housing satisfaction to the fact that the vast majority of households have complete and private facilities and, therefore, the lack of variation precludes strong covariation.

The covariance model indicates several direct arrows from some of the independent variables to housing satisfaction. These suggest that there may be additional variables that should be considered as intervening variables which are not presently in the analysis. The most logical selection for these additional variables would be those that measure housing characteristics and are evaluated in the housing satisfaction scale but which do not appear as intervening variables in this study. For example, one might add variables which 1) objectively measure various

types of floor plans, 2) classify sizes of property, or 3) describe architectural features such as style and design of the dwelling.

It seems reasonable, however, that there is a positive correlation (.129) between age of the head of the household and housing satisfaction as older persons often exhibit a greater degree of contentment with their environment perhaps due to adjustment of their norms to correspond with the reality of the situation or due to familiarity with a particular life-style. The negative correlation of -.173 for the relationship of size of the household to housing satisfaction is also reasonable when one considers that stage in the family life cycle when size of the household is probably greatest is also the stage at which financial resources available for housing expenditures are more limited due to other commitments and due to a generally lower income relative to future income.

With respect to the quality of the findings in this study it is evident that a more accurate causal model for housing satisfaction has been developed in comparison to the models used in previous research of this nature. This is reflected in the magnitude of the R^2 obtained which in this study is .313. Previously the R^2 statistic has not reached beyond the .176 level as measured by Morris et al. (1976). One explanation for this might be that community size, and housing characteristics are better predictors of housing satisfaction than the normative housing deficits used in the other studies.

CHAPTER IV. CONCLUSIONS

Summary and Conclusions

The purpose of this study as reported is to test the hypothesis that there are variations in housing characteristics, housing quality, and residential satisfaction that are correlates of variations in community size and that these differences in housing are intervening elements in a hypothesized relationship that suggests that the size of community influences levels of housing satisfaction. The overall purpose of the research is to provide additional knowledge to aid in the refinement of present housing theory.

The empirical study of housing conditions and needs as discussed in this thesis serves to analyze the relationships between community size and the physical and quality aspects of housing. In conjunction with community size, demographic and socioeconomic variables were also analyzed. The housing characteristics including quality were tested along with neighborhood satisfaction for their strength as intervening variables in the causal model of size of community and its relationship to housing satisfaction. A factor of interest encompassing all phases of the model is how housing is influenced by the pattern of the rural-urban continuum in terms of community size.

The project from which the data were collected provides a comprehensive look at the housing conditions and needs in north central Iowa. Employing several analysis techniques, indication and/or clarification of any differences in physical and design aspects and in levels of

satisfaction with respect to housing among communities of various sizes was made. The single most valuable method of analysis was multiple regression using forward stepwise inclusion to account for the significant independent variables. Crosstabulations and one-way analysis of variance provided additional evidence upon which interpretations were made in relation to the statistical findings in the data.

The demographic and socioeconomic variables that were entered as control variables included age and marital status of the head of the household, socioeconomic class, size of the household, and length of residence in this community. Housing characteristics referred to the single-family homeownership dummy variable, number of rooms in dwelling, monthly value of housing services, and number of stories in the building while housing quality incorporated completeness of insulation and mechanical facilities, and number of structural and mechanical defects. Neighborhood satisfaction is in response to a combination of items which evaluate the proximity of place of work, schools and amenities and evaluates the acceptability of neighborhood people in relation to the respondents' preferences.

All five exogenous control variables have potential implications in relation to the needs for and conditions of certain housing characteristics. The analysis shows that age of the head of the household, marital status, and socioeconomic class clearly differ by community size and a marginal difference is apparent in the size of the households and the length of residence in the community. These are controlled for as independent variables in the regression of all other variables on size of community.

As pointed out in the analysis chapter, the community size dummy variables have a significant relationship with five of the dependent variables after controlling for the independent variables. These are: single-family homeownership, number of stories in building, completeness of insulation, neighborhood satisfaction, and housing satisfaction. Single-family homeownership and completeness of insulation produce the same pattern of differences between the community-size groups. Both indicate that the smallest communities (Group I) exhibit a greater percentage of single-family homeowners and greater number of insulating qualities per dwelling than the other community-size groups and the pattern follows the rank order of the sizes of community with Group IV (population of 10000 and over) having the smallest proportion of single-family homeowners and the smallest proportion of dwellings with complete insulation features.

Number of stories in building and housing satisfaction have the converse relationship with size of community in that Group IV features the highest level of housing satisfaction and has the greatest number of buildings with more than two stories and this tendency decreases relative to community size with Group I (population of under 2000) appearing to have the lowest housing satisfaction and the fewest number of dwellings over two stories.

The relationships found in differing community sizes to single-family homeownership and number of stories in the building is not surprising as one expects more rental units in the larger centers and a larger number of multistory buildings. It does seem unusual, however, that single-family homeownership (the North American norm) does not lead

to higher levels of housing satisfaction. This was noted in the discussion of the causal diagram. The fact that smaller communities are found to have more complete insulation features is acceptable when one considers that there is a much higher proportion of homeowners in these categories than in the larger community-size groups.

The remaining variable, neighborhood satisfaction, indicates that the three smaller community-size groups (I, II, and III) have higher levels of neighborhood satisfaction than does Group IV. This is interesting in view of housing satisfaction which ranks Group I and II lowest on the scale. It could be speculated that as a greater degree of homogeneity in terms of socioeconomic class and race usually exists in smaller communities that the respondents in these areas are more comfortable with their neighbors who share similar characteristics. Housing satisfaction, on the other hand, is a reaction to nonhuman factors such as physical conditions and design attributes as influenced by housing availability and finances available for housing. A number of cases in the smaller communities indicates that there are a fair number of young families residing here and perhaps they are planning to renovate their present dwelling in the future but at present would rather sacrifice some housing satisfaction in exchange for the neighborhood appeal while their families are still in the expanding stages. Monthly value of housing services in not significant in relation to differing sizes of community so this factors does not influence the relative neighborhood and housing satisfaction levels as an intervening variable. However, the monthly value of housing services exhibits the second strongest direct correlation with housing satisfaction

(next to neighborhood satisfaction) and it is possible that this variable encompasses qualities of other variables and is perhaps suppressing what could be more sensitive relationships due to its overriding effects.

Direct relationships between three of the independent variables and housing satisfaction indicate that there may be variables not in the present model that would intervene in the relationships if they were to be included in the analysis. The independent variables involved are size of community, age of the head of the household, and size of the household. It is not unusual, however, that age of the household head and household size are directly related to housing satisfaction. Older heads of households usually appear to be more content with their environment and reduced household size is related to age and to family life cycle and it follows that these factors effect the amount of financial resources available for housing expenditures. One might speculate that the "missing" intervening variables would be those that are related to items in the housing satisfaction scale which are not now measured under housing characteristics and housing quality.

Upon retrospection of the various components of housing and their relationships to size of community, it has been concluded that housing does have a place in the rural-urban continuum. Four out of five comprehensive variables follow the pattern as suggested by the continuum whereby housing characteristics which are most evident in the smallest communities diminish in importance to where they are least evident in the largest community. The same pattern applies to the existence of distinctive

characteristics of large communities in that these housing characteristics appear less frequently as the community-size groups decrease in population.

Suggestions for Further Research

In an effort to refine the housing satisfaction model, modification of the housing characteristics included in this study would perhaps prove to be worthwhile. Variables which have a higher degree of relatedness to the individual items in the housing satisfaction scale and yet are not repetitive would no doubt reveal a greater number of relationships between housing characteristics and housing satisfaction. Further, reduction of the monthly value of housing services variable into several single item variables would aid in diffusing the possible overpowering effects of this variable in terms of its strong relationship with housing satisfaction.

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